



**ATTO Technology, Inc.**

**ATTO iPBridge™ 2500C/R/D  
Installation and Operation Manual**

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# 1 iPBridge 2500 provide storage options

*Two protocols available on the iPBridge 2500 allow storage devices such as hard drives, tape drives and libraries and CD jukeboxes to attach easily to Internet Protocol networks such as Gigabit Ethernet. The ATTO iPBridge supports the high throughput needs of streaming data transfers, optimizing performance and management using ATTO Technology intelligent Bridging Architecture™.*

The ATTO iPBridge 2500 has two models depending on the protocol you have chosen: either the iSCSI protocol or the NDMP protocol.

**The iSCSI protocol** increases the capabilities and performance of storage data transmission by transmitting data over local area networks (LANs), wide area networks (WANs), or the Internet, providing location-independent data storage and retrieval to enhance current and future Storage Area Networks (SANs).

**NDMP** version 4.0 provides backup for network-attached storage (NAS) tape and CD devices. NAS devices are dedicated file servers and cannot host applications such as backup software. NDMP defines a common agent to interface between any NAS device and any backup software program, minimizing demand on network resources, and enabling local backups and disaster recovery. The protocol is being developed by the Storage Networking Industry Association (SNIA) NDMP Working Group.

**Gigabit Ethernet** (GbE) is a transmission technology based on the Ethernet format and

protocol used in local area networks (LANs). It provides a data rate of 1 billion bits per second (one gigabit) as defined in the IEEE 802.3 standard.

**intelligent Bridging Architecture**, the engine within ATTO FibreBridge™ and iPBridge products, uses ATTO Data Routing Fabric topology and ATTO Virtual Device Manager to optimize performance.

The iPBridge 2500C/R/D provides a compact embeddable, rack or desktop solution which may be installed in a wide range of system configurations. Uniquely designed to support the high throughput needs for applications that require streaming data transfers (data backup), the iPBridge optimizes performance by using ATTO Technology intelligent Bridging Architecture.

You may choose an iPBridge 2500C/R/D which supports the iSCSI protocol or one which supports the NDMP protocol, maximizing application, system and network configuration flexibility and support.

## iPBridge2500 features

- Physical configuration: board, rackmount or desktop
- 1 Gigabit data transfer rate per sec.
- 2 SCSI ports (SCSI bus 0, 1)
- Ultra 3 SCSI negotiation max capability
- Serial management port
- a 10/100/1000 Ethernet management port (MPn) which may be used as a data port in the iPBridge 2500 iSCSI model.
- two 10/100/1000 Ethernet data ports (DP0, DP1)
- iSCSI or NDMP protocol
- ATTO ExpressNAV browser-based management
- Advanced diagnostics

**SpeedWrite:** a performance-enhancing capability that significantly boosts Write performance by efficiently managing Write commands between host and a tape device. Using the iPBridge results in a higher throughput and shorter backup times compared to native Fibre tape or direct attached SCSI tape libraries.

**Advanced Diagnostics:** software event-logging capability time and date stamped by the real time clock. You can also determine numerous status and current configuration parameters.

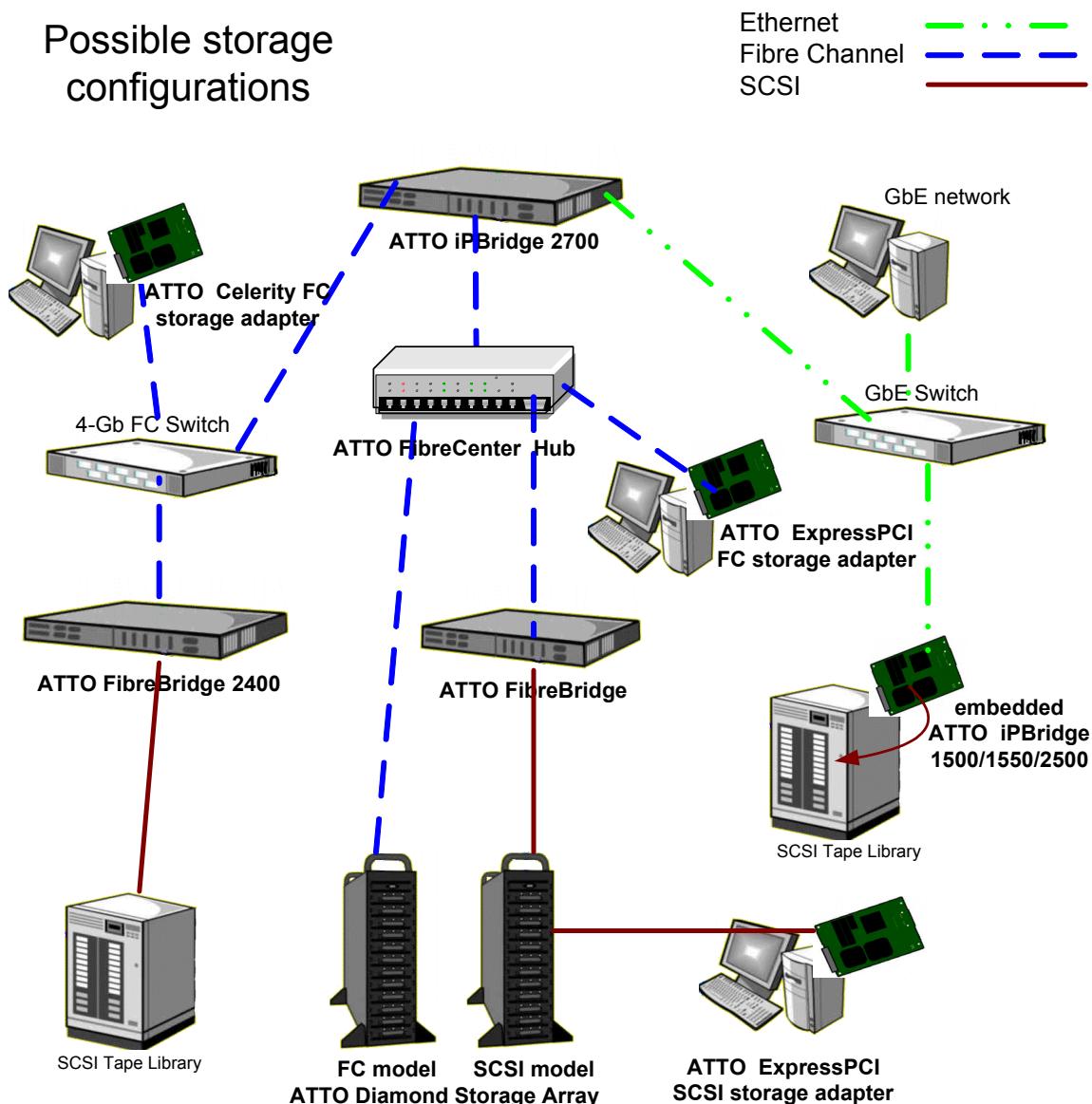
**ATTO ExpressNAV:** a web-based management application that allows all of the configurable settings for the iPBridge to be defined, viewed and edited.

### Connectivity, infrastructure solutions

The topology of a heterogeneous Storage Area Network shown below demonstrates the critical role ATTO products play in the design and

implementation of a SAN. Whether your application needs are data-intensive or bandwidth intensive, you need to store and manage that data and then deliver it to end-users efficiently. ATTO products have been engineered with the highest performance and lowest cost available today.

## Possible storage configurations



# 1.1 ATTO iPBridge 2500R/D

*The ATTO iPBridge 2500R/D is a 1-Gigabit Ethernet to SCSI 1U full-rack bridge for midrange high performance, cost effective solutions in enterprise environments.*

The iPBridge 2500R/D includes a single power supply, two Ethernet data ports, an Ethernet management port which may be used as a data port in the iPBridge 2500 iSCSI-configured model, a serial management port and two SCSI data and management ports. It includes a battery-backed Real-Time-Clock, and an IP Time client (RFC 1631 compliant).

Designed to fit into a 1U, full-rack enclosure, the iPBridge 2500R/D supports side mounting so it may be mounted into a standard 19-inch rack. The ports and AC power are accessed from the rear of the unit while LEDs showing port activity and status are in the front and rear.

## Dimensions

**Width:** 16.91 inches wide (42.95 cm)

**Depth:** 10 inches deep (25.4 cm)

**Height:** 1.72 inches high (4.32 cm (1U))

**Weight:** approximately 2 pounds

## Environment

**Operating temperature:** 0-70° C external

Ambient air should not exceed 40°C.

User-configurable thermal sensor for automatic shutdown default is 70°C

**Blower and airflow:** air enters through the slots in the rear panel and exits through the blower on the far end of the rear panel.

**Humidity:** 10-90% non-condensing

## Power

**Internal power supply:** single-output 5VDC, 25-watt open frame switching power supply with universal input via a standard IEC320 adapter mounted within the enclosure. Provides power for the board and the cooling fan and is not hot swappable.

**Input voltage:** 120-240VAC, 50-60 Hz, fused on the power supply.

**Power draw:** 4 amps at 5.0V DC.

**Battery-backed event log SRAM:** A rechargeable Lithium ion battery cell holds the memory in a 512KB SRAM for up to 30 days. If the iPBridge has been disconnected from power, recharging begins automatically when power is restored to the system. The battery is fully charged after 36 hours of continuous power application.



## WARNING

**Risk of explosion if battery is removed and/or replaced by an incorrect type.**  
**Dispose of used batteries in accordance with your local environmental regulations.**

## SCSI interface

The two independent SCSI ports on the iPBridge 2500R/D connect storage devices into the Ethernet Storage Area Network (SAN). Each port is completely independent from the other.

The ports are Ultra 3 LVD/SE SCSI busses with 68-pin "P" interface: 160 MB/sec. maximum throughput, downward compatible with all forms of single-ended SCSI.

The iPBridge supports all SCSI devices including hard disk drives, tape drives, RAID controllers and DVD, MO and CD libraries.

## Ethernet interface

The two independent 10/100/1000 Ethernet RJ45 data ports, labeled Ethernet ports 0 and 1, use the Intel 8254x family gigabit Ethernet chipset to support telnet-based data transfer. A separate 10/100/1000 Ethernet standard RJ45 management port, labeled Ethernet port 2, provides monitoring and management through a command line interface or ATTO ExpressNAV, a browser-based interface. It may be used as a data port in the iPBridge 2500 iSCSI-configured model.

GbE cables must be at least CAT-5E certified for 1000 Mb/sec. use.

## Serial interface

The RS-232 serial port provides support for remote monitoring and management through a command line interface. It is set at the factory at 115,200 bps.

Pin outs of the RJ11 connector, part number CBL-0911-001 are

### Pin Description

- 2 TXD
- 3 Ground
- 4 RXD
- 5 Ground

## LED indicators

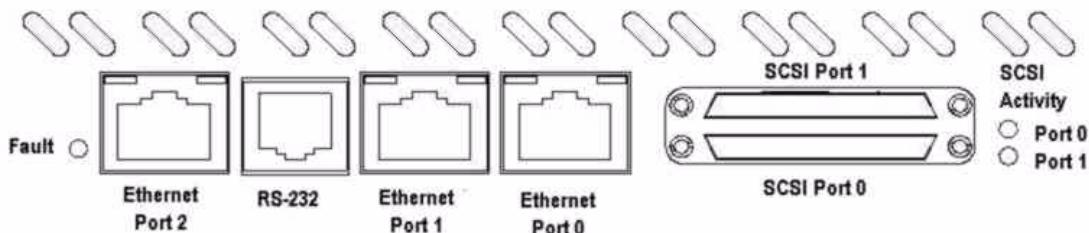
The LED indicators can be viewed from the front of the iPBridge 2500R/D.

**Ethernet Link & Activity:** Each Ethernet port has its own set of LEDs to show link status and speed as well as busy status.

**SCSI 0 Activity, SCSI 1 Activity:** each SCSI bus has its own LED to show activity on that bus (numbered 0 and 1).

**Fault:** should light yellow when power has been applied, then immediately go dark. Software activates the LED if there is a system error.

*Exhibit 1.1-1 ATTO iPBridge 2500R/D connector side*



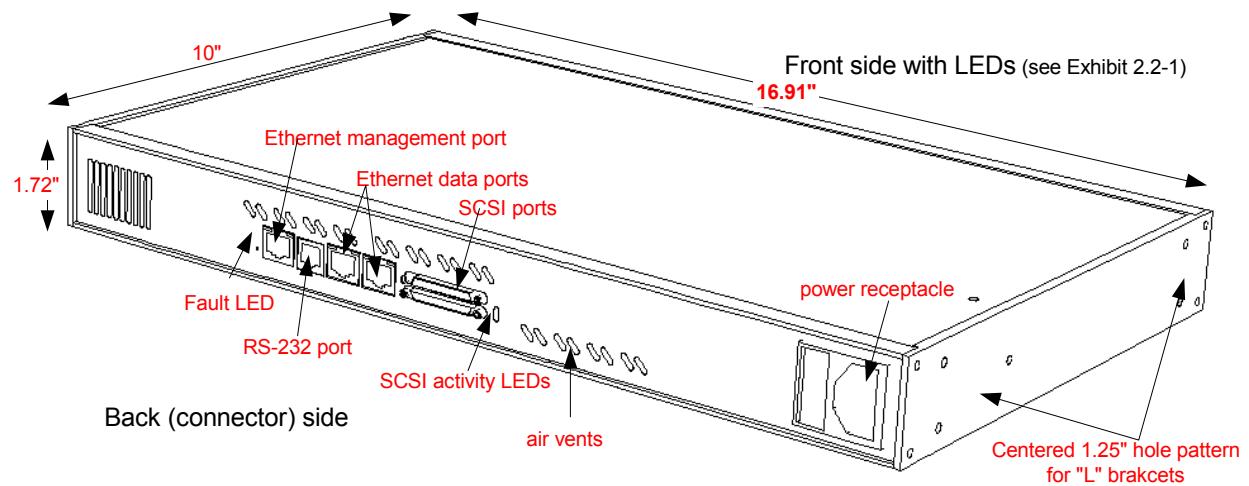
## Installation instructions

The ATTO iPBridge 2500R/D offers a variety of ways to connect into a SAN.

- 1 Note the serial number of your iPBridge for later use:
- 2 Install the iPBridge 2500R/D in your desktop or rackmount environment.
  - a. Attach "L" brackets so that front side with the LEDs face front and the connector side is at the back.
  - b. Install the iPBridge horizontally within the rack so it does not reduce the air flow within the rack.
- 3 Connect the AC power cord from the iPBridge to the proper AC source outlet.

- a. Properly ground the iPBridge to the rack equipment. The earth ground connection must be maintained.
- b. The power requirements plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.
- 4 Connect SCSI devices to the iPBridge, and attach CAT 6 or CAT 5E cables to the GbE data port(s) on the iPBridge. (For details, refer to [the Appendix, Cabling](#), on page iii).
- 5 Configure the iPBridge using the instructions in [Configuring the iPBridge](#) on page 9.

*Exhibit 1.1-2 Overview of iPBridge 2500R/D standard 19-inch rack using a centered 1.25-inch (31.7 mm) hole pattern*



## 1.2 ATTO iPBridge 2500C

*The ATTO iPBridge 2500C is a 1-Gigabit Ethernet to SCSI embeddable cPCI bridge for high performance, cost effective solutions in enterprise environments.*

The iPBridge 2500C includes two Ethernet data ports, an Ethernet management port which may be used as a data port in the iPBridge 2500 iSCSI-configured model, a serial management port and two SCSI ports. It includes a battery-backed Real-Time-Clock, and an IP Time client (RFC 1631 compliant).

### Dimensions

**Width:** 6.193 inches

**Length:** 6.375 inches

**Height of tallest component:** .535 inches

### Environment

**Operating Temperature:** 0-70°C external

Ambient air should not exceed 40°C.

**User-configurable thermal sensor** for automatic shutdown default is 70°C

**Humidity:** 10-90% non-condensing

**Recommended airflow:** 11 cubic feet per minute

### Power

The iP2500C board may be powered from the cPCI backplane or a 6-pin connector.

**Input voltage:** 5.0V DC  $\pm 5\%$  derived from cPCI or 6-pin connection. Fused at the backplane and hot swap protection.

**Power draw:** 3 amps at 5.0V DC. Battery-backed event log SRAM: A rechargeable Lithium ion battery cell or Super Cap holds the memory in a 512KB SRAM based on the following chart.

Recharging begins automatically when power is restored to the system.

	Time to charge battery or CAP	Backup power duration
Battery (typical)	36 hours continuous power	30 days
Super CAP worst case	60 seconds	3 hours
Super CAP typical	>320 seconds	5-15 hours



### WARNING

**Risk of explosion if the battery is removed and/or replaced by an incorrect type. Dispose of used batteries in accordance with your local environmental regulations.**

### SCSI interface

The two independent SCSI ports on the iPBridge 2500C connect storage devices into the Ethernet Storage Area Network (SAN). Each port is completely independent.

The ports are Ultra 3 LVD/SE SCSI busses with 68-pin "P" interface: 160 MB/sec. maximum throughput, downward compatible with all forms of single-ended SCSI.

The iPBridge supports all SCSI devices including hard disk drives, tape drives, RAID controllers and DVD, MO and CD libraries.

### Ethernet interface

The two independent 10/100/1000 GbE RJ45 data ports, labeled Ethernet port 0 and Ethernet port 1, use the Intel 8254x family gigabit Ethernet chipset to support telnet-based data transfer. A separate 10/100/1000 Ethernet standard RJ45 management port, labeled Ethernet port 2 and which may be used as a data port in the iPBridge 2500 iSCSI-configured model, provides monitoring and management through ATTO ExpressNAV, a browser-based interface.

GbE cables must be at least CAT-5E certified for 1000 Mb/sec. use.

Pin outs of the RJ11 connector, part number CBL-0911-001 are

### Serial interface

The RS-232 serial port provides support for remote monitoring and management through a command line interface. It is set at the factory at 115,200 bps.

### Pin Description

- 2 TXD
- 3 Ground
- 4 RXD
- 5 Ground

## Installation instructions

- 1 Install the iPBridge 2500C in the target device. (See the board layout diagram below)
- 2 Connect SCSI devices to the iPBridge, and attach CAT 6 or CAT 5E cables to the GbE data port(s) on the iPBridge. (For details, refer to [the Appendix, Cabling](#), on page iii).
- 3 Connect to power.
- 4 Configure the iPBridge using the instructions in [Configuring the iPBridge](#) on page 9.

*Exhibit 1.2-1 ATTO iPBridge 2500C faceplate*

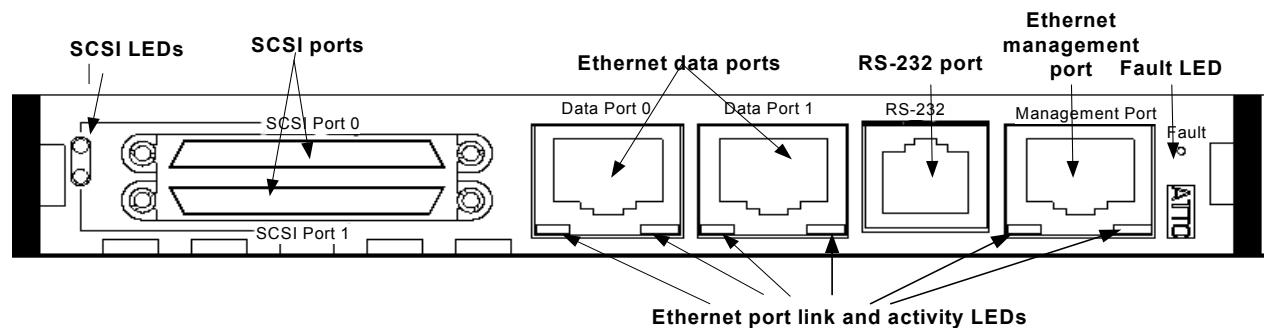
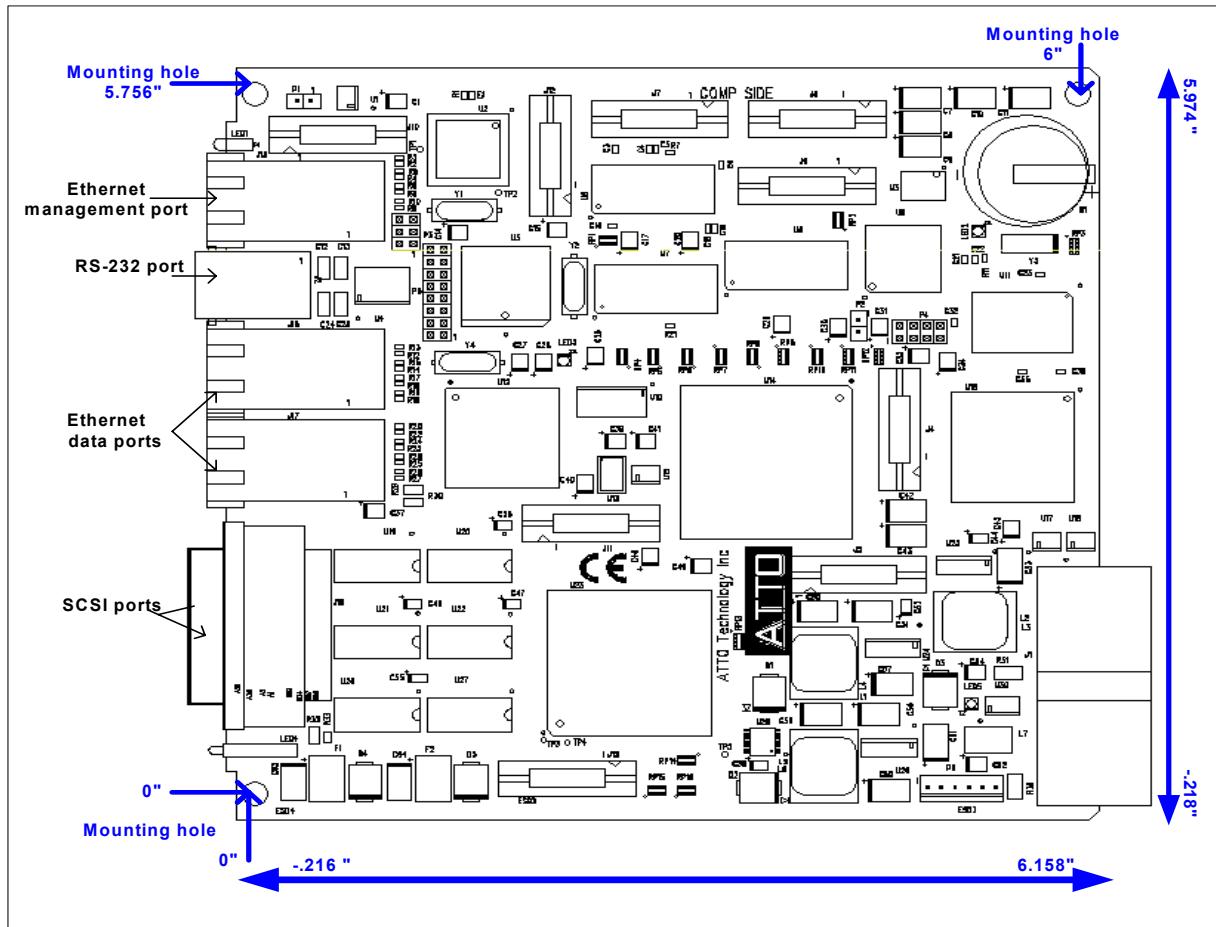


Exhibit 1.2-2 ATTO iPBridge 2500C board layout



## 2 Configuring the iBridge

*Set up your iBridge by first getting an IP address, then use ATTO ExpressNAV to map devices. Default values are appropriate for most configurations, but may be modified for your needs using ATTO ExpressNAV.*

Configuration of the ATTO iBridge, also known as iBridge Services, is available through the ATTO ExpressNAV, a browser-based interface, or the Command Line Interface (CLI).

ATTO iBridge Services configures and tunes the iBridge for many different environments and applications, updates the firmware, configures the addresses of the connected devices, monitors status and reports on hardware.

To use the iBridge, you must

- 1 Know the IP address for the iBridge. (Refer to [Getting an IP address](#) on page 10).
- 2 Map devices so that the iBridge can access the devices in your network. (Refer to [Mapping devices: NDMP](#) on page 13 and [Mapping devices: iSCSI](#) on page 15).

Additionally, it is best practice to change the default user name and password and to set the Real Time Clock. Refer to [Additional configurations](#) on page 19

Any changes must be saved and will not take effect until the iBridge is restarted.



### Note

*The recommended management tool for the iBridge is ATTO ExpressNAV. For details on the interface, refer to [ATTO ExpressNAV interface](#) on page 21.*

### Microsoft iSCSI Initiator changes

Installing the file **MSiSCSI\_Adj.reg**, found on the ATTO iBridge installation CD, makes several Windows operating system registry changes to optimize the ATTO iBridge performance when using the Microsoft iSCSI Initiator.

- 1 Install Microsoft iSCSI Initiator.
- 2 Double click on the file **MSiSCSI\_Adj.reg** found on the installation CD.  
The resident Windows operating system is updated to use optimal settings.

## 2.1 Getting an IP address

*Set up your iPBridge by first getting an IP address, then use ATTO ExpressNAV to map devices.*

The iPBridge is set up by default to request an IP address from a DHCP server. If you do not have a DHCP server to assign IP addresses to devices, get an IP address from your network administrator.

Use the QuickNAV utility from the CD included with your iPBridge to find your iPBridge on your network.

- 1 Work from the computer attached to the iPBridge on the same broadcast domain. Find and download the QuickNAV utility, **QuickNAV-windows.exe**, from the CD included with your iPBridge.
- 2 Turn on the iPBridge.  
Wait for the iPBridge Ready LED to light, up to three minutes, before proceeding.
- 3 Run the QuickNAV application.
  - a. Click **Next** on the QuickNAV Wizard page.
  - b. Select your iPBridge serial number from the list of choices displayed.
  - c. Click **Next**.
  - If you are using DHCP, note the IP Address assigned by the server:

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- If you are not using DHCP, configure the iPBridge with the IP Address and Subnet Mask given to you by your network administrator.

---

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- d. Click **Launch Browser**.

Your browser points to the ExpressNAV splash screen.

- 4 Enter the user name and password values.



### Note

*The default values are **username**: “root” and **password**: “Password”. The user name is case insensitive and the password is case sensitive.*

The iPBridge **Status** page appears.

- 5 Go on to [Mapping devices: NDMP](#) on page 13 or [Mapping devices: iSCSI](#) on page 15 depending on your model of the iPBridge 2500.

## 2.2 NDMP configuration provides backup

*NDMP (Network Data Management Protocol) provides backup for network-attached storage (NAS) devices. NAS devices are dedicated file servers and cannot host applications such as backup software. NDMP defines a common agent to interface between any NAS device and any backup software program, minimizing demand on network resources, and enabling local backups and disaster recovery.*



### Note

*For NDMP-configured iPBridge 2500 models only*

The ATTO iPBridge 2500, using the NDMP Version 4 Protocol Specification, 10/2001, (-skardal-ndmp4.03.doc), allows you to back up critical data locally using any combination of network-attached servers, backup devices and management applications from a central control, without taxing network traffic, by separating the data path and the control path.

### How NDMP works

The NDMP protocol allows data backup and restoration over telnet networks using file-level commands, rather than block-level IO instructions.

The typical NDMP setup includes

- a Data Service (usually disks)
- a Tape Service
- a client in control of the backup process called a Data Management Application (DMA).

The DMA controls the NDMP session. There is a master-slave relationship between the DMA and the data/tape servers. The iPBridge 2500 implements the Tape Service, along with a SCSI Service, to provide access to media changer devices.

The iPBridge 2500 platform provides several different types of management capability, including telnet/FTP through the two GigE data ports and an Ethernet 10/100/1000 management port which may be used as a data port in the iPBridge 2500 iSCSI-configured model, serial CLI management, and standard bridge hardware health checking.

A typical NDMP application involves a drive array, a host computer and a tape library. the host

computer may be attached to the disk and tape drives by any of several methods/technologies. The iPBridge uses Ethernet and Internet protocols.

The following example describes a host, Ethernet, tape library configuration.

- 1 The DMA sends messages to the tape library's SCSI Server to pick the appropriate cartridge and load it in the tape drive.
- 2 The DMA sends commands to the tape drive to position the tape and configure the tape for writing (block size, etc.).
- 3 The DMA opens a connection to the Data Server to exchange backup information.
- 4 The DMA commands the Tape Server to prepare to receive data.
- 5 The Tape Server responds with addressing information.
- 6 The DMA passes the address to the Data server.
- 7 The Data Server and Tape Server send data directly to each other.
- 8 Metadata generated by the DMA is written to tape to indicate the end of files, directories, path names, etc., passed through to the tape server between backup data transfers.
  - NDMP uses a windowing mechanism in which the Tape Server writes a portion of the data, then pauses and waits for the DMA to take charge. The DMA may start a new window or write some Metadata.
  - The DMA may also move the tape while the transfer is paused. Once the DMA has finished with the Metadata, a new window is established and the transfer from the Data Server to the Tape Server continues.
  - The Data Server has no notification of the Tape Server being paused, so it must rely on the TCP stack to queue up data transferred during the pause time, and to implement flow control when queues are full.

## Setting up NDMP

The ATTO iPBridge should first be configured for the network using the RS-232 port to establish the correct IP address, subnet mask, gateway and iPBridge names. Authentication can require the use of a client name-password pair, along with configuration of the security level (MD5, Text, or None) used for authentication. The iPBridge 2500 does not validate the client-name, and a single password is used for all password fields within the iPBridge 2500.

The NDMP port number is user-configurable, with the industry standard (10000) as the default. NDMP device mapping links a SCSI btl (bus, target, LUN) to an ASCII device name. If you do not use the default mapping, you must map devices before using NDMP.

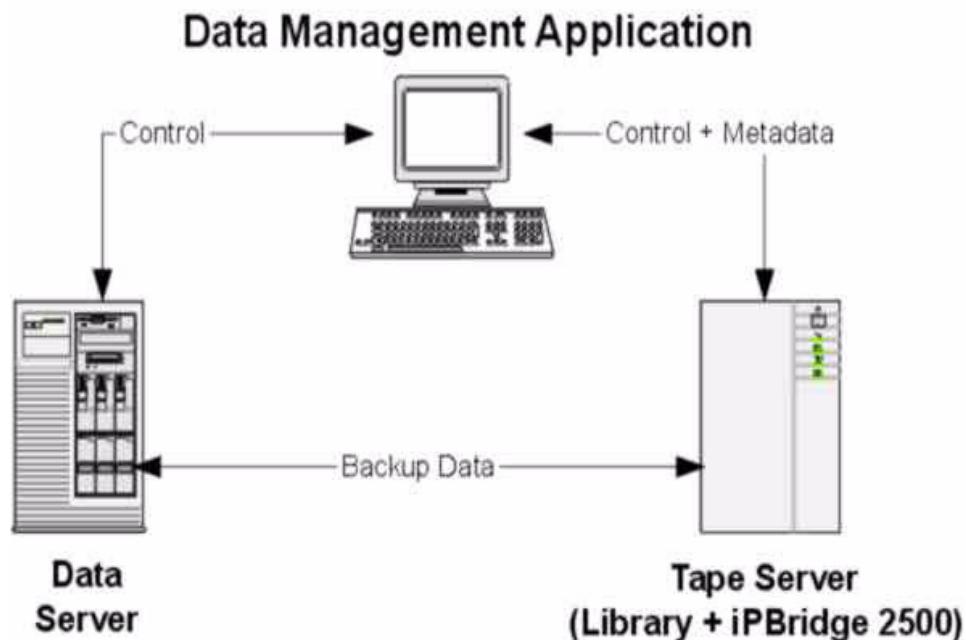
### Procedure

- 1 Configure IP addresses, subnet masks, IP gateways and iPBridge names if necessary (refer to [Getting an IP address](#) on page 10) for each port. Defaults are IP address 10.0.0.1; subnet mask 255.255.0.0
- 2 Configure mapping for SCSI devices (refer to [Mapping devices: NDMP](#) on page 13).

- 3 Set NDMP version number and NDMP port numbers for each data port you wish to use and the NDMP authorization type for all ports. The default NDMP port number is 10000.
- 4 Enter the **NDMP Max Version and Port Number** in the **Ethernet Port Configuration Page**
- 5 Click **submit**
- 6 Enter the **NDMP Authorization Type** in the **Bridge Configuration** page
- 7 Click **Submit**
- 8 Click **Restart** on the **Restart Firmware** page.
- 9 Configure third party software.

### Assign NDMP names to devices

- 1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 2 Type the NDMP names you want in the boxes at the right.
- 3 Drag the boxes to the ports you want.
- 4 Click **Submit**
- 5 Go to the **Restart Firmware** page and click **Restart**.



## 2.3 Mapping devices: NDMP

Access to SCSI devices is via SCSI bus, target and LUNs. CLI commands are used to modify the mapping. The easiest way to map devices is to use the Automap command through the ATTO ExpressNAV interface.



### Note

For NDMP-configured iPBridge 2500 models only.

The ATTO Technology ExpressNAV, a browser-based configuration tool, allows you to map devices to the SCSI ports using a web-based GUI. Refer to [ATTO ExpressNAV interface](#) on page 21.

### Map devices automatically

- 1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 2 Click **AutoMap**
- 3 Click **Submit**

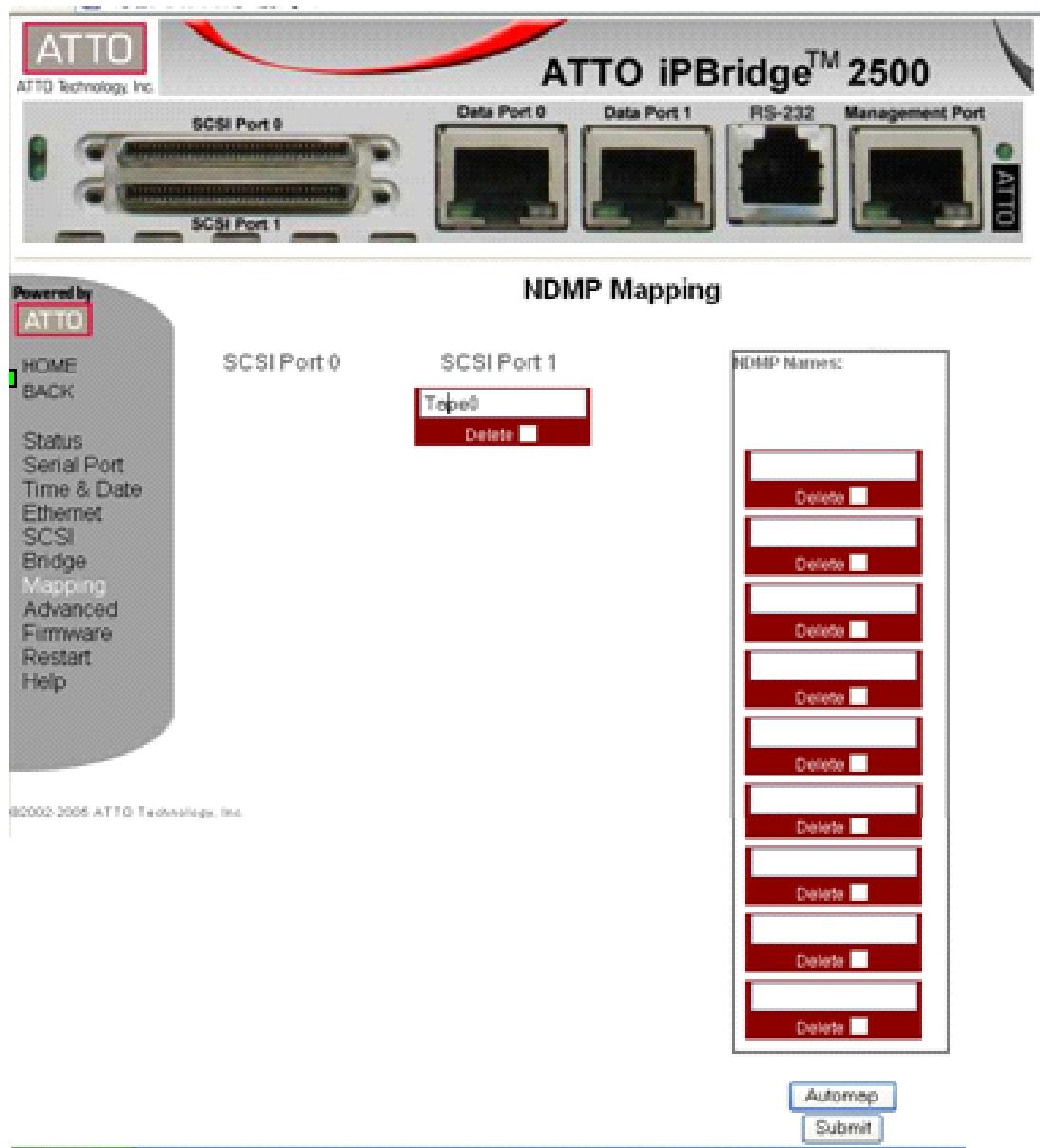
### Map devices manually

- 1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 2 Select the devices from the box on the right hand side of the screen and drag to the appropriate LUN on the left.
- 3 Click **Submit**.

### Assign NDMP names to devices

- 1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 2 Type the NDMP names you want in the boxes at the right.
- 3 Drag the boxes to the ports you want.
- 4 Click **Submit**.

Exhibit 2.3-1 Moving NDMP Names to SCSI ports under NDMP using the ATTO ExpressNAV interface.



## 2.4 Mapping devices: iSCSI

SCSI devices are mapped using the designations for the SCSI bus, target and LUN. CLI commands are used to modify the mapping. The easiest way to map devices is to use the Automap command, either through the CLI or the browser-based interface, ATTO ExpressNAV.



### Note

For iSCSI-configured iPBridge models only.

To map devices, you must have a host computer connected to the iPBridge serial port or an Ethernet port. Refer to [Getting an IP address](#) on page 10.

The recommended management tool for the iPBridge is ATTO ExpressNAV.

By default, a host or initiator views the iPBridge as a single iSCSI node with all available SCSI devices shown as LUNs on a single iSCSI target. Refer to [Exhibit 2.4-1](#)

You may use Multiple Target mode to break the single iSCSI node into multiple nodes. Multiple Target mode allows you to grant or deny access

between initiators and devices as needed. Refer to [Exhibit 2.4-1](#)

### Node names

iSCSI nodes are accessed through the Ethernet ports on an iPBridge, each identified by its own IP address.

The iPBridge uses the **iqn** name format, referencing the device serial number, to guarantee that the target name is world-wide unique:

iqn.1995-12.com.attotech:ipbridge:  
serialnumber



### CAUTION

Changing the device map can affect the host's view of devices and your application configuration.

## Single Target mode

Single Target mode is the default. Use ATTO ExpressNAV interface to map devices automatically or manually. Refer to [ATTO ExpressNAV interface](#) on page 21.

### Map devices automatically

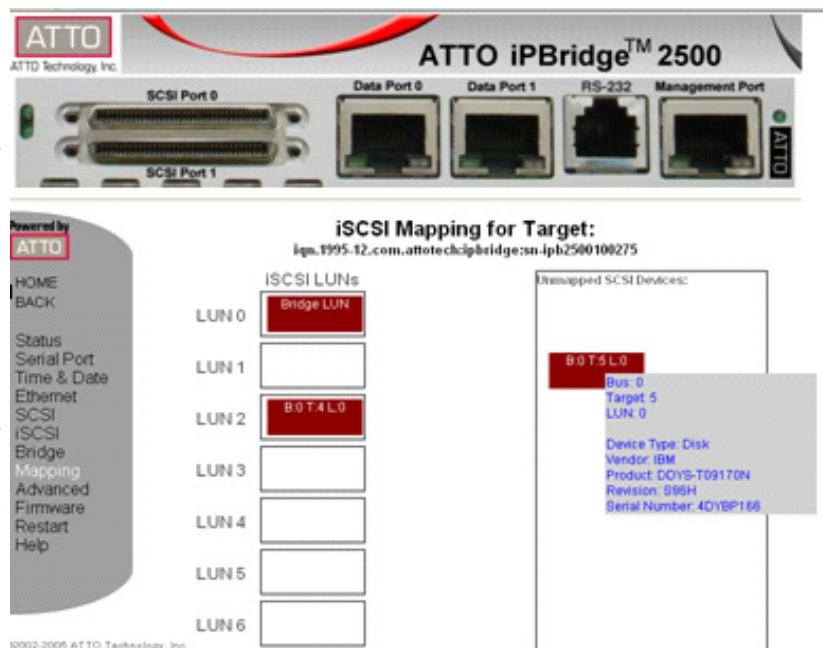
- 1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 2 Click **AutoMap**
- 3 Click **Submit**

### Map devices manually

- 1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 2 Select the devices from the box on the right hand side of the

screen and drag to the appropriate LUN on the left.

- 3 Click **Submit**.



## Multiple Target mode

Multiple Target mode breaks the single iSCSI node of the iPBridge and replaces it with a much more configurable mapping scheme. This new mapping scheme allows you to segregate storage into different iSCSI nodes within the iPBridge, with each iSCSI target having its own set of access criteria.

For example, if you have two servers and a library with four tapes and a media changer, the default mapping would provide both servers access to all tapes and the media changer (single target mode).

If you configured Multiple Target mode, you would be able to map some devices to one server and other devices to the other server, requiring separate usernames and passwords for access.



### CAUTION

If actual storage is mapped to more than one iSCSI target and a server has authorization for both targets, the server could show duplicate storage without any warning to the user.

If Multiple Target mode is enabled, the **Automap**, **Route**, **RouteDisplay** and **CHAP** CLI commands behave differently. (Refer to [iSCSI commands](#) on page 55)

To control access, different CHAP account names and CHAP secrets can be assigned to each target. (Refer to [iSCSI commands](#) on page 55)

Single Target mode is the default. Use ATTO ExpressNAV interface to map devices automatically or manually. Refer to [ATTO ExpressNAV interface](#) on page 21.

### Automatically configure Multiple Target mode

- 1 From the ExpressNAV main menu, click on the **iSCSI** menu item on the left side of the screen.
- 2 Click on the **Multi Target Mode enabled** button.
- 3 Click **Submit**.
- 4 Go to the **Mapping** page and type **[name]** in the **Add an iSCSI target** box

The name is a suffix appended to the standard iPBridge iqn name. The suffix name can be up to 24 characters.

- 5 Click on **Submit**.
- 6 In the greyed box at the bottom of the page, click on the target name you created.
- 7 In the next mapping page, click on **AutoMap**
  - All the CLI commands necessary to enable mapping are performed.
  - The iPBridge maps itself as a device at LUN 0.
  - A target name suffix is added to the iqn of each SCSI device such as

`bxtyy-vendorid-devicename`

- **x** is the iPBridge SCSI port number
- **yy** is the SCSI device SCSI target ID
- **vendorid** is the SCSI device vendor ID
- **devicename** is the SCSI device's inquiry device name.

- 8 To save the configuration, go the **Restart Firmware** page and click **Restart**.

### Manually configure Multiple Target mode

- 1 From the ExpressNAV main menu, click on the **iSCSI** menu item on the left side of the screen.
- 2 Click on the **Multi Target Mode enabled** button.
- 3 Click **Submit**.
- 4 Go to the **Mapping** page and type **[name]** in the **Add an iSCSI target** box

The name is a suffix appended to the standard iPBridge iqn name. The suffix name can be up to 24 characters.
- 5 Click on **Submit**.
- 6 In the greyed box at the bottom of the page, click on the target name you created.
- 7 After the next mapping page opens, drag the boxes representing SCSI devices to the LUNs you want. (See Exhibit 2.4-2.)
- 8 Click **Submit**.
- 9 Repeat from [Step 4](#) for each target you want to configure.
- 10 To save the configuration, go the **Restart Firmware** page and click **Restart**.

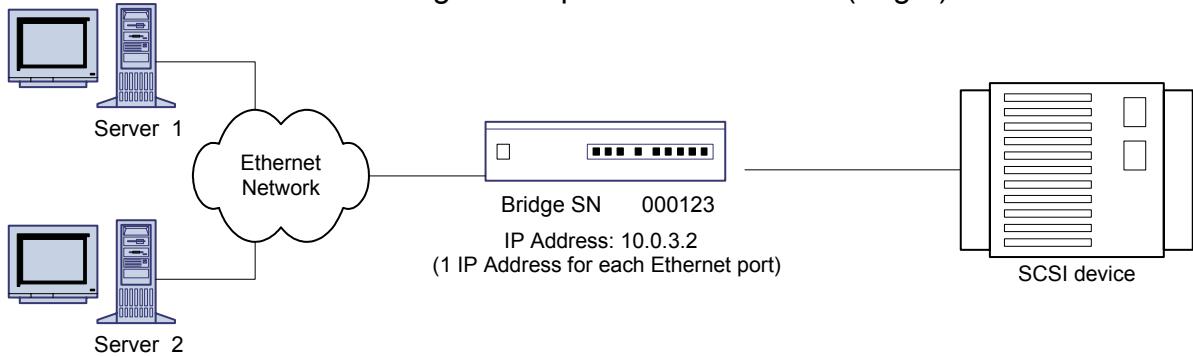
Exhibit 2.4-1 Examples of single and multiple target modes

## Physical connections

Initiator/Host to Network

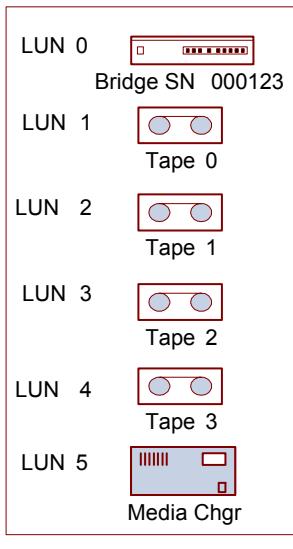
Network to iPBridge Ethernet port

iPBridge SCSI port to SCSI device (target)



## Mapping: single vs. multi target mode

SCSI device configuration  
Single Target mode



Node 0  
iqn.1995-12.com.attotech:  
ipbridge:sn-ipb 2500000123

SCSI device configuration  
Multiple Target mode

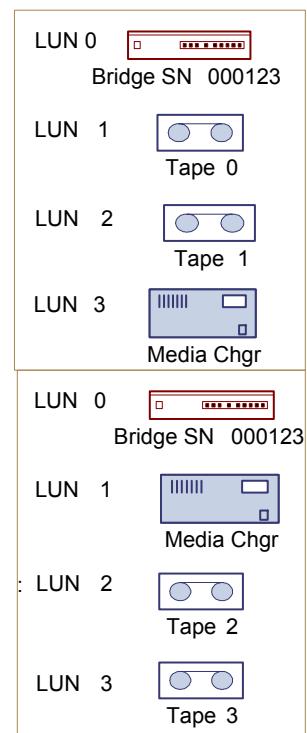


Exhibit 2.4-2 Mapping with ATTO ExpressNAV

The screenshot shows the ATTO ExpressNAV interface for the ATTO iPBridge™ 2500. At the top, there is a photograph of the hardware with labels for SCSI Port 0, Data Port 0, Data Port 1, RS-232, Management Port, and an ATTO logo. Below the hardware image, the title "iSCSI Mapping (Multi Target Mode) for Target: iqn.1995-12.com.attotech:ipbridge:npb2500100275abc" is displayed. A sidebar on the left lists navigation options: HOME, BACK, Status, Serial Port, Time & Date, Ethernet, SCSI, iSCSI, Bridge, Mapping, Advanced, Firmware, Restart, and Help. The main content area shows "Mapping for abc". On the left, a table lists "iSCSI LUNs" for LUN 0 through LUN 4. LUN 0 is mapped to "Bridge LUN", LUN 1 is mapped to "B0 T4 L0", and LUN 2, 3, and 4 are empty. On the right, a box titled "Unmapped SCSI Devices" shows a single entry: "B0 T5 L0" with details: Bus: 0, Target: 5, LUN: 0. Below this, a box displays device information: Device Type: Disk, Vendor: IBM, Product: DDYB-T09170N, Revision: S98H, Serial Number: 4DYBP166. At the bottom right are "Automap" and "Submit" buttons.

## 2.5 Additional configurations

*Default values are appropriate for most configurations, but may be modified for your needs using ATTO ExpressNAV.*

It is best practice to change the default user name and password to a user name and password significant to you.



### Note

*If you have completed configuration operations at any time and have clicked **Submit** on the page you are viewing, go to the **Restart** page and restart the iPBridge to save the settings. If not, go on to the next command.*

### Change the current user name, password

- 1 If you have not already, open an ExpressNAV session. For instructions, refer to [Opening an ExpressNAV session](#) on page 21.
- 2 Click **Bridge**.

The **Bridge Configuration** page is displayed. The user name that you are currently logged in with is displayed in the **Username** text box.

- 3 Enter appropriate information into the **Username**, **Current Password**, **Old Password**, **New Password**, and **Confirm Password** text boxes.



### Note

*The user name is case insensitive and password is case sensitive.*

- 4 Click **Submit**.
- 5 The username and password for all Telnet, FTP and ATTO ExpressNAV sessions are changed.

### Set the Real Time Clock

The time is set automatically by default using using the Simple Network Time Protocol (SNTP). However, you may change the time manually.

- 1 If you have not already, open an ExpressNAV session. Refer to [Opening an ExpressNAV session](#) on page 21.
- 2 Click **Time & Date**.
- 3 If you are setting the time manually, proceed to the next step. If you are using a time server on your network to set the time, click **Simple Network Time Protocol enabled**.

- a. Type the IP address of the time server in the **Time Server** text box.

- b. Click **Submit**. Exit this procedure.

- 4 If you are setting the time manually, click **Simple Network Time Protocol disabled**.
- 5 Click **Submit**.
- 6 Select a time zone from the **Time Zone** drop-down choices.
- 7 In the box marked **HH:MM:SS** enter the desired time in hours, minutes, and seconds.
- 8 In the box marked **MM:DD:YYYY** enter the desired month, day, and year in digits.
- 9 Click **Submit**.



### Note

*The iPBridge must remain powered on for more than 36 hours to ensure the date and time are set.*

### Create a read only password or user name

You may set a read only password or a read only user name. Refer to [General use commands](#) on page 39.

- 1 If you have not already, open an ExpressNAV session. For instructions, refer to [Opening an ExpressNAV session](#) on page 21.
- 2 Click **Bridge**.
- 3 Enter the Admin password in the first line of the boxed area.
- 4 Enter the desired information into the **Admin Username**, **New Admin Password**, **Confirm New Admin Password** or **New Read Only Password** and **Confirm New Read Only Password** text boxes.
- 5 Click **Submit**.
- 6 The username or password for all Telnet, FTP and ATTO ExpressNAV sessions are changed.

## Configuring SCSI devices

- 1 If you have not already, open an ExpressNAV session. For instructions, refer to [Opening an ExpressNAV session](#) on page 21.
- 2 Determine the current speed and transfer rates: type at the SCSI page.
- 3 **SCSI Port Bus Speed** controls the transfer rate at which the iPBridge attempts to negotiate with its SCSI devices. Default is Ultra3. Complete the appropriate settings.
- 4 **SCSI Port Sync Transfer** specifies whether synchronous SCSI transfers should be negotiated with devices on the specified SCSI port. The default is enabled. Change the setting if desired.

## SNMP protocol

Remote system monitoring is available using Simple Network Management Protocol (SNMP). An agent resides in the iPBridge which takes information from the iPBridge and translates it into a form compatible with SNMP. If certain conditions arise, the agent sends asynchronous notifications (traps) to a client.

Refer to [Diagnostic commands](#) on page 42 for detailed information on the commands which regulate SNMP on the iPBridge.

Contact your network administrator for the MIB software and appropriate MIB file for your iPBridge. Use the **SNMP** page of the ExpressNAV interface to enable traps or extended traps.

### 3 ATTO ExpressNAV interface

*The easiest way to communicate with the ATTO iPBridge is to use the browser-based interface. ATTO Technology's ExpressNAV, a browser-based configuration tool, contains all the current capabilities of the CLI in a user-friendly GUI interface accessed through a web browser.*

Access from any web browser that supports the latest standards for XHTML 1.0 and CSS1. To take full advantage of the ExpressNAV interface you should have JavaScript™ enabled through your browser.



#### Note

*The recommended management tool for the iPBridge is ATTO ExpressNAV.*

#### Browser compatibility

To make ExpressNAV as compatible as possible with as many browsers as possible, all pages are written in pure XHTML 1.0 and CSS1. It is compatible with the latest versions of Internet Explorer, Netscape, Mozilla (including K-Meleon, Camino, Mozilla Firefox, Epiphany and Galeon), and KHTML (including Konqueror and Safari).

Minimum requirement for Windows-based systems is Internet Explorer 5.5 or Netscape 6.2. The minimum requirement for Macintosh browsers is Internet Explorer 5.2 or Safari 1.2.

#### To optimize ExpressNAV in Internet Explorer

- 1 Go to the browser toolbar and select **Tools**
- 2 Select **Internet Options**
- 3 Select the **Security** tab
- 4 Select the **Custom Level** button.
- 5 On the menu presented, go to the **Microsoft VM, Java permissions** and make sure **Disable Java** is *not* selected.
- 6 Go to the **Miscellaneous** topic and select **METAREFRESH**.

#### Accessing ExpressNAV

ATTO ExpressNAV resides on the iPBridge. Use the QuickNAV utility to identify your iPBridge and use the ExpressNAV interface.



#### Note

*For Windows-based systems with a DHCP server only.*

- 1 Connect the Ethernet ports to your network. Refer to [Getting an IP address](#) on page 10.
- 2 Work from the computer attached to the iPBridge serial port. Find and download the QuickNAV utility, **QuickNAV-windows.exe**, from the ATTO website, [www.attotech.com](http://www.attotech.com), or from the CD included with your iPBridge.
- 3 Turn on the iPBridge.
- 4 Run the QuickNAV application.
  - a. Click **Next** on the QuickNAV **Wizard** page.
  - b. Select your iPBridge serial number from the list of choices displayed.
  - c. Click **Next**.
  - d. Click **Launch Browser**.

Your browser points to the ExpressNAV splash screen.

#### Opening an ExpressNAV session

ATTO ExpressNAV is the recommended management tool for the iPBridge. It is a web-based graphical user interface (GUI) that allows you to manage the iPBridge by clicking choices and commands in traditional GUI fashion or by entering CLI commands directly, as you would in a terminal emulation session.

- 1 Obtain the IP address of the iPBridge management port (mp0).  
This address was set in [Getting an IP address](#) on page 10.
- 2 Point your browser at the IP address of the iPBridge.
- 3 The **ExpressNAV** home page is displayed. Click **Enter**.
- 4 Enter the user name and password values. The default values are **username**: "root" and **password**: "Password". The **username** is case insensitive and **password** is case sensitive.



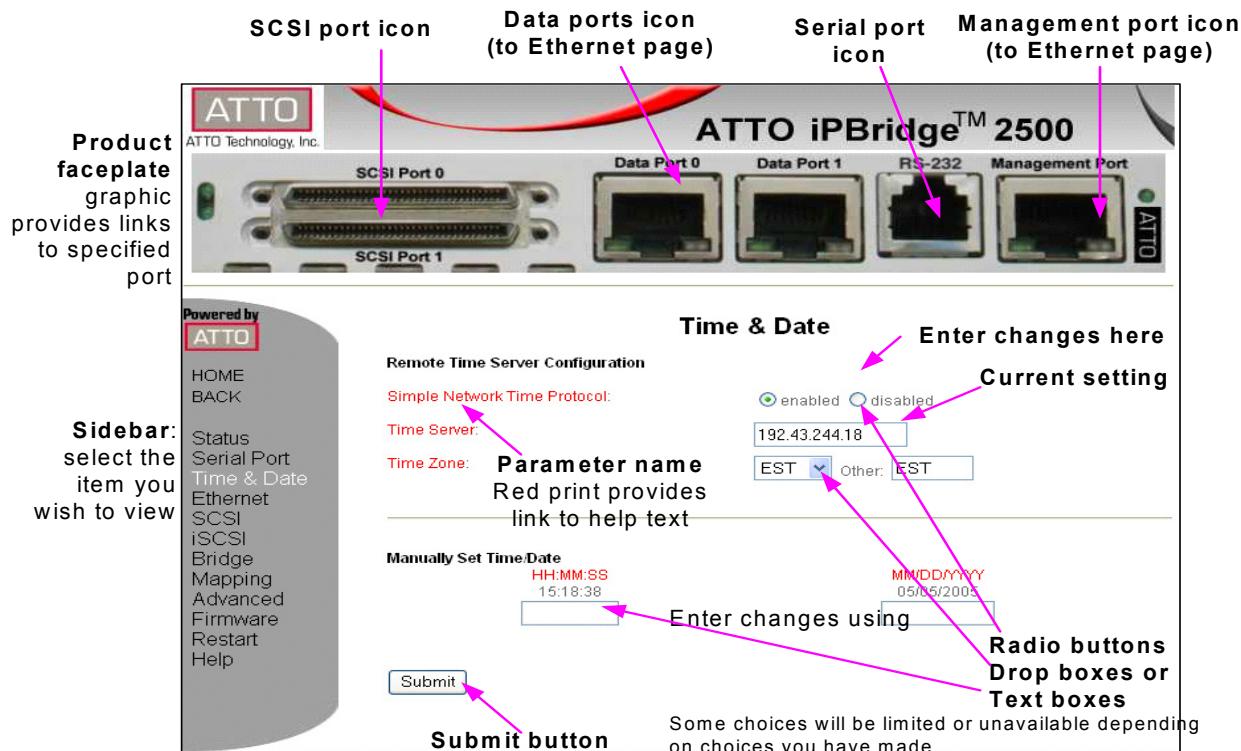
#### Note

*It is best practice to change the default user name and password after you have configured your iPBridge. If you do so, record the new user name and password in a convenient place.*

The **Status** page appears.

- 5 Follow the links to find information or configure your iPBridge. Each link takes you to a page such as the **Time & Date Configuration** page in Exhibit 3.0-1. Refer to [ExpressNAV pages](#) on page 23 for details on these pages.

Exhibit 3.0-1 An ExpressNAV page



## 3.1 ExpressNAV pages

Each page in the ATTO ExpressNAV interface provides information and/or configuration parameters based on a specific topic. Each page can be reached through the menu at the side of each page. An image on each page's header shows each port in the product faceplate. Each port is clickable and takes you to the appropriate page.

### Status

Displays iPBridge information:

- Vendor ID, product ID, firmware revision number and serial number
- Valid temperature range, current temperature and current voltage
- Ethernet port IP addresses and status

### Serial Port Configuration

Configures the baud rate and echo parameters. Refer to [Serial port configuration commands](#) on page 49 for details on each option.

### Time & Date Configuration

Configures the real-time clock or accesses a remote time server. Configurable options are:

- Enable/disable Simple Network Time Protocol
- Time Server and time zone
- Manually set time and manually set date

Refer to [Maintenance commands](#) on page 41 for details each parameter.

### Ethernet Port Configuration

Configures each port independently for the following parameters:

- Enable/disable DHCP
- IP address, gateway, subnet mask and Ethernet speed
- MTU

For NDMP configurations only

- NDMP max. version and NDMP port number

Refer to [Getting an IP address](#) on page 10, [NDMP commands](#) on page 53 and [Ethernet commands](#) on page 51 for details.

### SCSI Configuration

Configures each port independently for the following parameters:

- Bus speed
- Enable/disable sync transfer
- Enable/disable wide transfer
- Initiator ID
- Enabled/disable bus reset on startup
- Enable/disable bus termination

Attached devices are listed for each bus and you can reset each port from this screen.

Refer to [SCSI configuration commands](#) on page 47.

### iSCSI Configuration

Defines the iSCSI CHAP target name, account name and secret and configures the following parameters:

- iSCSI Alias
- iSCSI Port Number
- Enable/disable iSNSLoginControl
- Enable/disable Multi Target Mode
- Enable/disable SpeedWrite
- Enable/disable CHAP settings: direction (in or out)

Refer to [iSCSI commands](#) on page 55 for details on each parameter.

### Bridge Configuration

Defines a name for the bridge, sets an admin user name and password, a read only user name and password, restores defaults or configures the following parameters:

- Minimum and maximum operating temperature
- Operating temperature warning
- Enable/disable Identify Bridge

For NDMP configurations only

- NDMP authorization type

Refer to [Maintenance commands](#) on page 41 for details on each parameter.

### Mapping

Maps drives. If in Multiple Target mode in an iSCSI model, you may choose, add or delete an iSCSI target. Refer to [Mapping devices: NDMP](#) on page 13, [Mapping devices: iSCSI](#) on page 15, and [Mapping commands](#) on page 57 for details.

### Advanced CLI Configuration

Allows you to input any CLI command available through the iPBridge. See Exhibit 3.1-1 for an example.

- 1 Type in the CLI command
- 2 Click the **Submit** button.

A text field beneath the box lists the most recent commands issued to the iPBridge through this page.

If you enter an incorrect parameter, the CLI help text is displayed, showing the parameters available.

- 3 If your entry was correct, type **saveconfiguration**
- 4 Click the **Submit** button. Your changes are implemented.

## Firmware

You may update firmware using ExpressNAV. Refer to [Updating firmware](#) on page 25.

## Restart

Implements a firmware restart of the bridge and makes permanent any changes you have made since the last firmware restart.

- 1 Click the **Restart** button.

*Exhibit 3.1-1 CLI command entered incorrectly on the **Advanced CLI** page, error message with suggested solution, then correct entry with response.*

```
Ready.
get scsiportbusspeed

ERROR Wrong/Missing Parameters
Usage:
[set | get] ScsiPortBusSpeed [sb] [fast | ultra | ultra2 | ultra3]

Ready.
get scsiportbusspeed 0
Port 0 ScsiPortBusSpeed = ultra3

Ready.
```

A box tells you to wait until the counter gets to 0 and then the browser refreshes.

- 2 If the browser does not refresh after the counter gets to 0, click the link to refresh it manually.



### Note

*Restarting the firmware may take a few minutes.*

## Help

Gives help information about the command line interface commands and troubleshooting tips via links to pages with help text for each category of options and one link to the Troubleshooting Tips and FAQs page on the ATTO website, [www.attotech.com](http://www.attotech.com), or from the CD included with your iPBridge.

Contact information for ATTO technical support is on the right.

Help is always available by pressing any word shown in red on the screen.

## 4 Updating firmware

Several processors control the flow of data in the ATTO iPBridge. The firmware to control these processors can easily be upgraded in the field using the ATTO ExpressNAV interface or the **PUT** command from an FTP connection. The ATTO ExpressNAV method is preferred.

### Preliminary steps

- 1 The iPBridge firmware is distributed as a compressed .zip file and can be obtained from the ATTO Technology, Inc. web site at [www.attotech.com](http://www.attotech.com) or from the CD included with your iPBridge.
- 2 Uncompress the .zip file into an image file (.ima). Note the filename.



#### CAUTION

Before beginning this procedure, ensure that all I/O to the iPBridge has stopped. During this procedure, *do not* interrupt the flash process.

*Do not power down the host or the iPBridge until the display returns the Ready prompt.*

*Interrupting the flash process will make your iPBridge inoperable and you will have to return it to ATTO Technology for repair.*



#### Note

*The recommended management tool for the iPBridge is ATTO ExpressNAV.*

### Using ATTO ExpressNAV

- 1 Connect to ExpressNAV (refer to [ATTO ExpressNAV interface](#) on page 21) and click on the **Firmware** page.
- 2 Click **Browse** and locate the firmware you unzipped in the preliminary steps.
- 3 Click **Upload** and wait until a success message is displayed.
- 4 Click the **Restart** link.
- 5 Click on **Restart**.

### Using FTP over GbE

- 1 Establish an FTP link to the bridge that is to be flashed.
- 2 Use the **PUT** command to download the firmware you unzipped in the preliminary steps. For example  
`c:\bridge_firmware\I25i0300.ima`
- 3 Once the download is complete, cycle power on the iPBridge or use the **FirmwareRestart** CLI command.

# 5 Copying iPBridge configurations

You can copy the configuration from one iPBridge to another in the field using the **GET** and **PUT** commands from an FTP connection or the **ZModem SEND** and **RECEIVE** commands over a serial connection.

An iPBridge configuration file can be saved from one iPBridge and copied to another iPBridge.



## Note

*Before beginning this procedure, ensure that all I/O to the iPBridge has stopped.*

*Do not power down the host or the iPBridge until the display returns the Ready prompt.*

## Using FTP over GbE

- 1 Establish an FTP link to the iPbridge with the desired configuration.
- 2 Ask for the configuration file using the **GET** command:  
ftp>get clone.cln
- 3 Upload the file to the second iPBridge
  - a. Establish an FTP link with the second iPBridge
  - b. Use the **PUT** command:  
ftp>put clone.cln
- 4 Once the upload is complete, cycle power on the second iPBridge.

## Using ZModem over the serial port

- 1 Connect to the first iPBridge using the serial port. Refer to [Alternative interface options](#) on page 33.
- 2 Load a Terminal Program such as Hyper Terminal.
- 3 Set the terminal and the iPBridge for the highest possible baud rate for your terminal.

Default parameters are: 115200 baud, N, 8, 1 no handshaking and ASCII Terminal.

- 4 Turn on power to the first iPBridge.
- 5 Once the **Ready** prompt appears, type **ZModem send clone.cln**
- 6 Turn on power to the second iPBridge and connect to its serial port.
- 7 Once the **Ready** prompt appears, type **ZModem receive**. The iPBridge is ready to receive a file from your terminal program.
- 8 On the terminal program, choose **Transfer Send File/ZModem send**
- 9 In the **Send File Box**, enter the iPBridge cln file name or click the browse button to find it.  
c:\bridge\_firmware\clone.cln
- 10 Click **Send File**
- 11 The iPBridge displays a message such as  
Ready.  
ZModem receive  
  
ZMODEM waiting for file.  
Execute ZMODEM send command on host to complete...  
B000000027fed4  
B000000027fed4  
Updating NVRAM...  
  
ZMODEM transfer complete.
- 12 When the iPBridge returns **Ready**, cycle power on the iPBridge.

# 6 Troubleshooting

---

*If it is clear that a particular component system is at fault in a problem situation, go directly to that component. If it is not clear, the best approach is to troubleshoot using the inside-out method.*

You may check on the status of your iPBridge using the ExpressNAV interface. Refer to [ExpressNAV pages](#) on page 23 to see which pages may contain the information you need. You may also look for information by using the diagnostic CLI commands, enumerated in [Diagnostic commands](#) on page 43, in the Advanced page of the ExpressNAV interface, or by

using the CLI directly (refer to [CLI provides ASCII-based interface](#) on page 35.)

To start and use the ExpressNAV interface, including how to access the version information, refer to [ATTO ExpressNAV interface](#) on page 21.

## Inside out method

---

To troubleshoot using the inside out method, begin with the device(s) connected to the iPBridge first, then work your way out.

- SCSI devices
  - iPBridge SCSI ports
    - iPBridge internal configuration
    - iPBridge Ethernet/IP ports
    - LAN/WAN
      - Ethernet host adapter or NIC in host
      - iSCSI OS driver
      - OS
      - Application

## Check the host event log

---

Check the event log on the host. Look for the most recent entries and determine what could be causing a

problem, then go to that event and continue troubleshooting.

## Check the iPBridge event and trace logs

---

Check the iPBridge event log through the CLI. Refer to [Diagnostic commands](#) on page 43. Look for the most recent entries and determine what could be

causing a problem. Then go to that event and continue troubleshooting.

## Visually inspect LEDs

---

Light Emitting Diodes (LEDs) are located on both sides of the iPBridge

If there is a non-fatal power supply problem, or if a problem is detected before shut down occurs, the **Fault** LED flashes. The Fault LED also flashes briefly during start up.

Each SCSI bus has its own LED to show activity on that bus. The LED blinks when I/O is occurring and is solid when there is heavy activity.

The **Fault** LED lights yellow when the iPBridge is turned on, then immediately goes dark. Software activates the LED if there is a system error.

## Check for problems on attached devices

---

Check the following in order to find problems on attached devices:

- LEDs

- Display panels
- Firmware levels
- Operability

## Check host versions

---

Check the following to find problems on attached hosts:

- Operating system version
- Service pack version
- Host adapter version
- Host adapter firmware version

- Host adapter device driver version
- iSCSI driver version

If an update is required, perform the update. For an updated list of supported iBridge host platforms and host adapters, visit [www.attotech.com](http://www.attotech.com).

## Check iBridge product versions

---

For a current list of required updates, visit [www.attotech.com](http://www.attotech.com).

- 1 Start ATTO ExpressNAV.

To start and use the interface, including how to access the version information, refer to [ATTO](#)

[ExpressNAV interface](#) on page 21.

- 2 If an update is needed, download the update from [www.attotech.com](http://www.attotech.com). Refer to [Updating firmware](#) on page 25.

## Component check

---

Use this procedure to check system components. For more information on the commands used in this procedure, refer to [CLI provides ASCII-based interface](#) on page 35.

### Checking SCSI devices

- 1 Check SCSI devices to make sure they are all set to different SCSI IDs.  
By default, the iBridge SCSI ports use SCSI ID 7 so drives should use IDs 0 through 6 and 8 through 15.
- 2 Check the SCSI device power. Make sure the devices are powering up.
- 3 Watch the drive lights before, during, and after startup. Many drives have term power lights that should be on before startup and turn off when system boots.
- 4 Verify the external terminator is the correct type and does not have damaged pins.
- 5 Check cable integrity. Check the cables for solid connections. Make sure they are screwed down. Inspect cable ends for bent pins.
- 6 If termination is correct, and the problem persists, try drives one at a time with different cables, adding drives and cables until the

problem occurs. This helps pinpoint the drive or cable causing the problem.

- 7 Check with the manufacturer of SCSI device(s) for further troubleshooting methods.

If SCSI devices appear to be working, move on to the iBridge SCSI port section.

### Checking the iBridge SCSI ports

- 1 Verify the iBridge has its termination set properly. By default, termination is enabled.
- 2 Either through the ATTO ExpressNAV or CLI, perform a SCSI bus scan on each SCSI port. Refer to [SCSI configuration commands](#) on page 47.  
If no devices appear, re-check SCSI cables and termination. If garbage information appears, the problem is most likely a bad SCSI cable or termination.
- 3 Check the internal cabling of the SCSI device. LVD SCSI cable lengths are limited to 12.5 meters. Longer cable lengths can cause problems. Internal cabling is also considered when calculating total cable length. For details, refer to [Cabling](#) on page iii.
- 4 Some older SCSI devices improperly negotiate with the iBridge SCSI port. If older devices are

not showing up, contact your service representative.

5 If all devices appear, invoke the **ScsiTargets** command several times on each SCSI port to verify that the devices can be seen. If devices disappear then appear again, the problem is most likely a SCSI cable. For information on the **ScsiTargets** command, refer to [SCSI configuration commands](#) on page 47.

If all devices appear and remain, move to the iPBridge internal configuration section.

When changing any setting on the iPBridge the configuration must be saved by using either the **saveConfiguration** CLI command or through the ATTO ExpressNAV interface.

### Checking the serial port

- 1 Verify you have the correct settings and that your terminal is configured to:
  - Baud rate: 115200
  - Data bits: 8
  - Stop bits: 1
  - Parity: off
  - Flow control: None
- 2 Verify that your serial cable is less then two meters in length.

### Checking the iPBridge internal configuration

Verify that the SCSI devices are mapped properly. Check in the ATTO ExpressNAV interface or use the **routedisplay iSCSI** command to show mappings. If devices do not appear, power down the iPBridge and power back on. Refer to [Mapping devices: NDMP](#) on page 13, [Mapping devices: iSCSI](#) on page 15 and [Mapping commands](#) on page 57.

When changing any setting on the iPBridge, the configuration must be saved by using either the **saveConfiguration** CLI command or through the ATTO ExpressNAV interface.

### Checking iPBridge Ethernet ports

- 1 Check Ethernet cable integrity. Check the cables for solid connections. Cat5 cable can cause connection issues with Gigabit Ethernet. Cat6 cable is the best cabling for the iPBridge.
- 2 Verify the IP address, subnet mask, and gateway are properly set on each data port on the iPBridge for your network environment. Refer to [Getting an IP address](#) on page 10.

- 3 Verify that the Ethernet speed is set to auto: invoke the **get EthernetSpeed all** command, check the **Ethernet** page of the ATTO ExpressNAV interface, or check the LED link lights to determine if the Ethernet speed is correct.
- 4 Determine if the iPBridge is set to get its IP information from a DHCP server. If so, verify that the DHCP server has available IP addresses. Refer to [Getting an IP address](#) on page 10.
- 5 Verify that each used Ethernet port on the iPBridge can be pinged from the desired host. Refer to [Ping](#) on page 52. If the host cannot ping the iPBridge ports and the iPBridge ports are properly configured, continue to the Local Area Network/Wide Area Network section, [Checking the LAN/WAN](#) on page 29. Verify that each port on the iPBridge can ping each desired host. Refer to [Ping](#) on page 52. If the iPBridge cannot ping the host, continue to [Checking the LAN/WAN](#) on page 29.
- 6 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host.
- 7 Some older switches/hosts cannot auto negotiate between the iPBridge and the switch/host at the desired speed. You may have to force the host/switch or the iPBridge to the desired speed.
- 8 Verify that the host is logging into the iPBridge correctly by viewing the **Connections** page and determining if there a “session open” status.
- 9 Verify that you are using the correct log in procedure for your initiator. For example: When connecting using the Adaptec initiator, the log on screen requests the iPBridge iqn (iSCSI qualified name). If left blank, Adaptec cannot log in. Enter “iSCSI” into this field for auto iqn discovery.

When changing any setting on the iPBridge the configuration must be saved by using either the **saveConfiguration** CLI command or through the ATTO ExpressNAV interface.

### Checking the LAN/WAN

- 1 Verify that the switch/switches are segmented properly so that hosts and the iPBridge have access to each other.

- 2 If there are routers involved in the setup, make sure the IP addresses and/or MAC addresses of the iPBridge are allowed through the router.
- 3 Verify that the switch can see the iPBridge on the port(s) in question. Refer to your switch vendor's guide for more information.

## Checking the iSCSI Host Adapter or NIC

iSCSI host adapters appear as a type of Storage Controller to the host OS, not as a standard NIC. These adapters usually have hardware acceleration to offload the TCP processing from the host. Configuration of these adapters is usually done through the vendor's own utility and not through the OS itself.

NICs come in two types: accelerated and unaccelerated. Accelerated NICs use some hardware to offload some of the TCP processing from the host. Unaccelerated NICs make the OS do all TCP processing.

To check the iSCSI host adapter or NIC

- 1 Check cable integrity. Check the cables for solid connections. Make sure they are plugged in properly. Inspect cable ends for broken clips and improper wiring.
- 2 Verify that the iSCSI host adapter or NIC is configured with the correct IP information.
- 3 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host.
- 4 Verify that the hosts are running the recommended driver and firmware level for the iSCSI host adapter or NIC vendor.
- 5 Verify that the hosts and the iPBridge are using the same port number to communicate via iSCSI. The default port number for the iPBridge is 3260. Refer to [iSCSIPortNumber](#) on page 55.
- 6 Make sure the host adapter/NIC is configured to log into the iPBridge. Some iSCSI host adapters do not re-login upon reboot or unplug/replug event without marking a check box.
- 7 Some older switches cannot autonegotiate between the host and the switch properly. You may have to force the host or switch to the desired speed.

For a NIC using an OS iSCSI driver, continue to the iSCSI OS driver section.

## Checking the iSCSI OS driver

This section is for hosts using a driver that allows the OS to talk to iSCSI targets via a NIC, not an iSCSI storage adapter.

- 1 A PC using an iSCSI storage adapter and an iSCSI OS driver might not work correctly on the same machine. Check with the vendors to make sure they are compatible.
- 2 Verify that the PC has the latest iSCSI driver as well as the required service packs and patches. Check with the iSCSI OS driver vendor for more information.
- 3 Verify that the iSCSI OS driver has started. Look under **Device Manager** for Windows or **lsmod** for Linux.
- 4 Verify that the iSCSI OS is still looking for the iPBridge at the right IP address.
- 5 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host. Refer to [Ethernet Port Configuration](#) on page 23.
- 6 Verify that the NIC is configured with the correct IP information.
- 7 Verify that the hosts and the iPBridge are using the same port number to communicate via iSCSI. The default port number for the iPBridge is 3260. Refer to [iSCSIPortNumber](#) on page 55.
- 8 Check cable integrity. Check the cables for solid connections. Make sure they are plugged in properly. Inspect cable ends for broken clips and improper wiring.

## Checking the Operating System

- 1 Verify that the OS has the required service packs or patches installed. If not, obtain the proper service packs and patches and install them.
- 2 Some iSCSI host adapters and iSCSI OS drivers do not always automatically find new targets when plugged in or when forced to rescan. Reboot the hosts.
- 3 Check if the vendor has a new driver. If so, install it.

## Checking the applications

- 1 Verify that the application is running the latest device drivers for the devices connected to iPBridge. If not, get the latest device drivers and install them.
- 2 Verify with the application vendor if the iSCSI technology is supported on the version of the application being used.

# Performance issues

If the host is not getting the performance it should, check the following items.

## Checking SCSI devices

- 1 Verify that the devices are running at their highest possible SCSI speed. Refer to [SCSI configuration commands](#) on page 47.  
Mixing SE and LVD devices on the same SCSI bus forces the speed of the bus to SE, thus slowing faster LVD devices. The iPBridge cannot accelerate an already slow device. Refer to [Connecting SCSI devices to SCSI ports](#) on page iii of the Appendix.
- 2 Verify that the proper terminator is being used. An SE terminator forces the SCSI bus to SE speeds.

## Checking iPBridge SCSI ports

- 1 Verify that the SCSI port configuration is set to the highest speed using the ATTO ExpressNAV interface or CLI. Refer to [SCSI configuration commands](#) on page 47.  
The iPBridge SCSI port speed, wide negotiation, and sync negotiation settings all affect the speed of the port. By default, these settings are set for optimal speed.
- 2 Verify that the SCSI devices are equally distributed between the SCSI ports. Refer to [Alternative interface options](#) on page 33. Optimal performance is seen when only two high-speed SCSI devices are connected to each SCSI port.

## Checking iPBridge Ethernet ports

- 1 Verify that the data ports are set to auto negotiate or forced to 1000 Mbs. Refer to [Ethernet Port Configuration](#) on page 23.
- 2 Verify that the MTU size is set to optimal setting for the LAN/WAN environment.  
Refer to [Ethernet Port Configuration](#) on page 23. The current optimized frame size for the iPBridge is 9k. Smaller frame sizes cause a decrease in performance.
- 3 Verify that the iPBridge TraceLog feature is disabled. Tracelog tracks certain events that occur in the iPBridge. With this log enabled, performance suffers.  
Refer to [Diagnostic commands](#) on page 43.

## Checking the LAN/WAN

- 1 Verify that the MTU size is set to optimal setting for the LAN/WAN environment. Refer to [Ethernet Port Configuration](#) on page 23.  
9k frame size is the current optimized frame size for the iPBridge. smaller frame sizes cause a decrease in performance. Many switch and router vendors do not support the larger frame size of 9k or 16k.
- 2 Verify that each associated port in the IP SAN is configured for 1000Mbs.  
IP SAN traffic should be segmented so that it does not interfere with the main LAN network traffic. For better performance, the IP SAN should be on its own set of hardware.
- 3 Verify that packets are not being dropped along the LAN/WAN. Many utilities track packet activity and switch statistics.

## Checking Ethernet Host Adapter or NIC

Ethernet Storage Adapters generally outperform accelerated NICs and un-accelerated NICs by offloading most of the processing from the host. An accelerated NIC provides some offloading, but still requires a host OS iSCSI driver, making the host spend more CPU cycles.

An un-accelerated NIC does not offload anything so the CPU must do much of the processing.

To check the Ethernet host adapter or NIC

- 1 Verify that the adapter or NIC is sent to auto-negotiate or forced to 1000 Mbs.
- 2 Set the MTU size to the largest MTU size supported in the LAN/WAN. Refer to [Ethernet Port Configuration](#) on page 23.  
9k frame size is the current optimized frame size for the iPBridge. smaller frame sizes cause a decrease in performance. Many switch and router vendors do not support the larger frame size of 9k or 16k. Set the maximum transfer size to the most efficient size for the intended target(s). For many tape drives, 64k is the optimal setting.

## Checking the applications

Some applications can be configured to change transfer sizes. Configure the application for the optimal size for the particular SCSI device(s) connected to the iPBridge.

## Checking the host system

The faster the host, the faster your transfer times are. The work flow goes only as fast as the slowest connection in the host system, so transferring data from an IDE drive, 100Mb connection, a DLT 4000, a high speed RAID volume across the country, or other applications, slows the system no matter how fast everything else is in the system.

- 1 Verify that the iSCSI storage adapter or NIC is connected to the fastest PCI bus connector supported by the adapter or NIC.

If the adapter supports PCI-X, place the adapter in a PCI-X slot. If one is not available, the host might not achieve the optimal performance capable from the adapter.

Even placing a PCI-X adapter into a 64 bit 66 MHz slot loses performance. Some adapters

adjust clock speed depending on the speed of the PCI slot into which they are plugged.

- 2 The host OS disk and swap disk/partition/file should be on a high speed drive such as a SCSI drive to minimize the time needed to access the host's virtual memory.

The more memory a system has, the less time it spends accessing virtual memory (hard drive space).

## Checking the Operating System

If possible, eliminate swap space and virtual drives which require large amounts of system memory. However, the OS might not allow the elimination of swap space. An OS set to run many kinds of different servers spends much of its CPU cycle on other operations, thus slowing down performance.

## 7 Alternative interface options

*Alternative methods to using the ATTO ExpressNAV interface may be used to manage the iPBridge. ATTO ExpressNAV is the recommended interface.*

### Use the serial port or header

- 1 Connect a cable from iPBridge RS-232 serial port or header to the serial (COM) port on a personal computer.
- 2 Turn on the iPBridge.
- 3 Start a terminal emulation program on the personal computer, and use it to connect to the iPBridge. For example, if you are using HyperTerminal on a computer running a Windows operating system,
  - a. Type **iPBridge** in the **New Connection** dialog box.
  - b. Click **OK**.
  - c. In the **Connect To** dialog box, for the **Connect using** field select the COM port number to which your serial cable is connected.
  - d. Click **OK**.
  - e. In the COM Properties dialog box select the following values:
    - Bits per second: 115200
    - Data Bits: 8
    - Parity: None
    - Stop Bits: 1
    - Flow Control: None
    - Terminal type: ASCII
    - Echo: on
  - f. Click **OK**.
- 4 After you connect to the iPBridge, start-up messages are displayed. These messages are only displayed at start-up. The last line in the start-up message sequence is **Ready**. See the example in Exhibit 7.0-1 on page 34.



#### Note

*In serial port sessions, there is no prompt on the line below the word **Ready**. Begin typing commands in the blank line where the cursor is resting. No user name or password is required for serial port access.*

- 5 To verify that you have connected successfully, type **help** after the **Ready** prompt and press **Enter**.

- If a list of all available commands does not appear on the screen, review the steps in this section, check the cable, or contact service personnel until the problem is solved.

If you have difficulty using the serial port, verify that you have the correct settings and that your serial cable is less than two meters in length.

### Use Telnet

Up to three Telnet sessions can be conducted simultaneously. A serial port session can use the CLI while Telnet sessions are open. Whichever session issues the first “set” CLI command can continue to issue set commands, while the other sessions can only issue “get” commands or display information. Once a connection is established, refer to [CLI provides ASCII-based interface](#) on page 35.

- 1 Connect to the iPBridge from a computer on the same Ethernet network.
- 2 Start a Telnet session.



#### Note

*There is more than one way to connect to the iPBridge using a telnet program. Your telnet program may operate differently than in the following instructions.*

- 3 At the telnet prompt, issue the **open** command where x.x.x.x is the IP address of the iPBridge.  
telnet > open x.x.x.x
- 4 If you have to specify a port type, enter the port type “telnet” and the terminal type “vt100”.  
port type: telnet  
terminal type: vt100
- 5 Enter the default values for the user name, “root”, and the password, “Password”, if you did not set new values in [Change the current user name, password](#) on page 19.

*Exhibit 7.0-1 Start up messages.*

```
ATTO iPBridge 2500
(c) 2002 - 2005 ATTO Technology, Incorporated.

Firmware version Q75H release date May  5 2005, 12:29:33 Build Q75H

128 Megabytes of RAM Installed.

3 GbE Data Port(s).
2 LVD SCSI Interface Port(s).

Bridge World Wide Name = 20 00 00 10 86 50 05 08
Bridge Serial Number   = "IPB2500100275"
Bridge Name            = "iPBridge"

Internal Temperature = 35 C [0 - 70]

For help, type HELP.
Active Configuration = ATTO
May  5 2005 12:29:33 Q75H Initialization Complete
Scsi interface 0 Register R/W test      Passed
Scsi interface 0 Reset test            Passed
Scsi interface 0 FIFO test            Passed
Scsi interface 0 Master test          Passed
Scsi interface 1 Register R/W test      Passed
Scsi interface 1 Reset test            Passed
Scsi interface 1 FIFO test            Passed
Scsi interface 1 Master test          Passed

Initializing Port DP0.....
Initializing Port DP1.....
Initializing Port MP0.....
GBE hardware Init done.
Power-On Self-Test (POST) Completion Status: GOOD

Ready.
```

## 7.1 CLI provides ASCII-based interface

The command line interface (CLI) provides access to the ATTO iPBridge Services through a set of ASCII commands. CLI commands may be entered while in CLI mode.

iPBridge Services provide configuration and monitoring for the iPBridge. CLI commands may be entered while in CLI mode or on the ExpressNAV interface **Advanced CLI** page.



### Note

*The recommended management tool for the iPBridge is ATTO ExpressNAV.*

CLI commands are context sensitive and generally follow a standard format

[Get | Set] Command [Parameter 1 | Parameter 2]

followed by the **return** or **enter** key

CLI commands are case insensitive: you may type all upper or all lower case or a mixture. Upper and lower case in this manual and the **help** screen are for clarification only.

Commands generally have three types of operation: get, set and immediate.

The get form returns the value of a parameter or setting and is an informational command.

Responses to get commands are specified in the Results field for each command, followed by **Ready**.

The set form is an action that changes the value of a parameter or configuration setting. It may require a **SaveConfiguration** command and a restart of the system before it is implemented. The restart can be accomplished as part of the **SaveConfiguration** command or by using a separate **FirmwareRestart** command. A number of set commands may be issued before the **SaveConfiguration** command.

Responses to set commands are either an error message or **Ready**. \*. The asterisk indicates you must use a **SaveConfiguration** command to finalize the set command. **SaveConfiguration** asks if you want to restart the system or not.

Set commands which do not require a **SaveConfiguration** command, defined as immediate commands, are immediately executed. Responses to Immediate commands are either an error message or data results followed by **Ready**. For an example of a typical CLI command and response, see Exhibit 7.1-3 on page 38.

*Exhibit 7.1-1 Symbols, typefaces and abbreviations used to indicate functions and elements of the command line interface used in this manual.*

### Command conventions

Symbol	Indicates	Symbol	Indicates
[ ]	Required entry	Boldface words	must be typed as they appear
< >	Optional entry	Italicized words	Arguments which must be replaced by whatever they represent
	pick one of	mp0	Management port
...	Ellipses, repetition of preceding item	Dp	Data port (0<= Dp <= 1)
\n	end of line	sb	SCSI bus number (0<= sb <= 1)
-	a range (6 – 9 = 6, 7, 8, 9)	sl	SCSI LUN ID (0 <= sl <= 7)
		st	SCSI target ID (0 <= st <= 15)

## 7.1.1 CLI commands summary

*A summary of the Command Line Interface commands, their defaults, an example of how they might be used, and where you can find the specifics of the command. Commands which have no default values associated with them have a blank entry in that column of the table.*

Command	Defaults	Example	Page
AutoMap		automap	57
BridgeModel		get bridgemodel	43
BridgeName	iPBridge	set bridgename Omega6	43
ClearEventLog		cleareventlog	43
ClearTraceLog		cleartracelog	43
Date		set date 03/03/03	41
DisplayEventLog		displayeventlog	43
DisplayEventLogFilter		set displayeventlogfilter gen info enabled	43
DisplayTraceLog		displaytracelog	43
DisplayTraceLogFilter		set displaytracelogfilter all info enabled	43
DPMTU	1514	set dpmtu all 9014	51
DumpEventLog		dumpeventlog	44
DumpTraceLog		dumptracelog	44
EthernetSpeed	auto	set ethernetspeed 100	51
EventLog	enabled	set eventlog disabled	44
EventLogFilter	all disabled	set eventlogfilter gen info enabled	44
Exit		exit	51
FirmwareRestart		firmwarerestart	41
Help		help driveinfo	39, 44
IdentifyBridge	disabled	set identifyBridge enabled	39, 44
Info		info	44
IPAddress	10.0.0.1 10.0.0.2 10.0.0.3	get ipaddress dp1	51
IPDHCP	enabled	set ipdhcp disabled	51
IPGateway	0.0.0.0	set ipgateway dp1 200.10.22.3	51
IPSubnetMask	255.255.0.0	get ipsubnetmask dp1	51
ISCSIAlias	“ “	set iscsialias diamond	55
iSCSICchap	disabled	set iscsichchap enabled	55
iSCSICchapSecret	“ “	set iscsichapsecret in Data1 barbara556d12345	55
iSCSIPortNumber	3260	get isciportnumber	55
iSCSITarget		iscsitarget	55, 57
iSCSITargetNameDisplay		iscsitargetnamedisplay	44, 56, 57
iSNSLoginControl	disabled	set isnslogincontrol enabled	56

Command	Defaults	Example	Page
iSNSServer	0.0.0.0	get isnsserver	56
IsReserved		isreserved	44
MaxOpTemp	70	get maxoptemp	41
MinOpTemp	0	set minoptemp 10	41
MultiTargetMode	disabled	get multitargetmode	56, 57
NDMPAuthType	none	set ndmpauthtype text	53
NDMPMaxVersion	4	set ndmpmaxversion 3	53
NDMPPortNumber	10000	set ndmpportnumber DP0 200	53
NDMPStatus		ndmpstatus	44, 53
OpTempWarn	5	set optempwarn 15	41
Password	Password	set password	41, 51
Ping		ping dp0 192.42.155.155	52
ReadOnlyPassword	Password	get readonlypassword	51
ReadOnlyUsername	user	get readonlyusername	52
Reserve		reserve disabled	41
RestoreConfiguration		restoreconfiguration default	39, 41
RMON	refer to <a href="#">page 52</a>	refer to <a href="#">page 52</a>	52
Route		refer to <a href="#">page 57</a>	57
RouteDisplay		routedisplay ndmp	57
SaveConfiguration		saveconfiguration restart	39
SCSIInitID	7	set scsiinitid 0 1	47
SCSIPortBusSpeed	Ultra3	set scsiportbusspeed 0 fast	47
SCSIPortList		scsiportlist	45, 47
SCSIPortReset		scsiportreset 1	41, 47
SCSIPortResetOnStartup	enabled	set scsiportresetonstartup 0 disabled	47
SCSIPortSelTimeout	256ms	get scsiportseltimeout	47
SCSIPortSyncTransfer	enabled	set scsiportsynctransfer 0 disabled	47
SCSIPortTermination	enabled	set scsiporttermination 0 disabled	47
SCSIPortWideTransfer	enabled	get scsiportwidetransfer 1	47
SCSITargets		scsitargets 0	45, 47
SerialNumber		get serialnumber	45
SerialPortBaudRate	115200 baud	set serialportbaudrate 19200	49
SerialPortEcho	enabled	get serialportecho	49
SNMPDumpMIB		snmpdumpmib	45
SNMPExtendedTraps	disabled	set snmpextendedtraps enabled	45
SNMPTrapAddress	0.0.0.0 none	set snmptrapaddress 6 192.42.155.155 all	45
SNMPTraps	disabled	set snmptraps enabled	46
SNTP	enabled	get sntp	42
SNTPServer	192.43.244.18	set sntpserver 129.6.15.28	42

Command	Defaults	Example	Page
SpeedWrite		get speedwrite scsi all	48
SpeedWriteDefault	enabled	set speedwritedefault disabled	48
TailEventLog		taileventlog	46
Temperature		get temperature	46
Time		set time 03:32:30	42
TimeZone	EST	set timezone pst	42
TraceLog	disabled	set tracelog enabled	46
TraceLogFilter	disabled	set tracelogfilter all all	46
Username	root	set username Barbara	42, 52
VerboseMode	enabled	set verbosemode disabled	40
VirtualDriveResponse	disabled	set virtualdriveresponse enabled	48
Voltage		get voltage all	46
WrapEventLog	enabled	set wrapeventlog disabled	46
WrapTraceLog	enabled	set wraptracelog disabled	46
Zmodem		zmodem receive	42

*Exhibit 7.1-2 The following error messages may be returned by the Command line Interface:*

ERROR. Invalid Command. Type 'Help' for command list.

ERROR. Wrong/Missing Parameters

Usage: <usage string>

ERROR. Command Not Processed.

*Exhibit 7.1-3 If you enter a parameter for a CLI command incorrectly, the CLI help file displays the error message:*

Incorrect entry	→	Ready. get ethernetspeed 0
Error message including correct parameters as listed in <b>Help</b>	→	ERROR Wrong/Missing Parameters Usage: [set   get] EthernetSpeed [dp [0   1]   mp] [10   100   1000   auto]
Correct entry	→	Ready. get ethernetspeed dp0 EthernetSpeed = auto (1000)
Response	→	Ready.

## 7.1.2 General use commands

*These CLI commands are used in a variety of situations*

### **Help**

*Displays a list of available commands. If a command name is specified, displays detailed command-specific information.*

Immediate command: Help [command name]

### **Password**

*Specifies a password for all sessions: NDMP, telnet, FTP and ExpressNAV web-based interface. A prompt asks for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the **Password** confirmation prompts with no parameters. The command*

**RestoreConfiguration default** *sets the password to its default value.*

Default: Password

Set syntax: set Password

Requires a SaveConfiguration command

### **ReadOnlyPassword**

*Specifies a read only password for all sessions: NDMP, telnet, FTP and ExpressNAV web-based interface. A prompt asks for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command **RestoreConfiguration default** sets the password to its default value.*

Default: Password

Set syntax: set ReadOnlyPassword

Requires a SaveConfiguration command

### **ReadOnlyUsername**

*Specifies a read only user name for all telnet, FTP and ExpressNAV web server sessions. **Username** is case insensitive, 1-32 characters with no spaces.*

Default: user

Set syntax: set ReadOnlyUsername [username]

Requires a SaveConfiguration command

Get syntax: get Username

### **RestoreConfiguration**

*Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option undoes any changes made since the last save.*

Immediate command: RestoreConfiguration  
[Default | Saved]

### **SaveConfiguration**

*Many commands require a **SaveConfiguration** command to be executed indicated by the return Ready. \**

*When you invoke **SaveConfiguration**, the current configuration is permanently saved in the iPBridge and the new configuration becomes the active configuration.*

*If a firmware restart is required to make the requested change permanent, a prompt asks you to confirm the restart. You can override this request by indicating the override value on the command line.*

*You may make several changes through commands and **SaveConfiguration** before implementing the restart, but once you have restarted the iPBridge, all the command changes created before the restart and save are implemented. If you select the restart option, the iPBridge executes its complete start up cycle.*

***Restart or no Restart** parameter is optional*

Immediate command: SaveConfiguration <Restart | NoRestart>

**Username**

*Specifies a user name for all telnet, FTP and ExpressNAV web server sessions. **Username** is case insensitive, 1-32 characters with no spaces. Changes to the Admin Level user name requires an Admin Level password.*

Default: root

Set syntax: set Username [username]

Requires entering a password

Requires a SaveConfiguration command

Get syntax: get Username

**VerboseMode**

*Specifies the detail of feedback for the command line interface. Disabling this option removes parameter names from action commands and removes descriptions from information commands. Choices are enabled or disabled*

Default: enabled (returns have parameter information)

Set syntax: set VerboseMode [enabled | disabled]

Get syntax: get VerboseMode

## 7.1.3 Maintenance commands

*The CLI commands outlined in this chapter may be used to get information or perform functions which are used in a variety of situations with the ATTO iPBridge.*

### **Date**

*Sets the date for the iPBridge if SNTP has been disabled or is not available.*

Set syntax: set Date [MM] / [DD] / [YYYY]

Requires a SaveConfiguration command

Get syntax: get Date

### **FirmwareRestart**

*Causes the iPBridge to reboot, then re-initialize its firmware.*

Immediate command: FirmwareRestart

### **MaxOpTemp**

*Establishes/reports the maximum enclosure temperature alarm in degrees Celsius. If the temperature of the iPBridge rises above the maximum MaxOpTemp, thermal control event handling occurs.*

*Valid entries are between 55 and 70 degrees C*

Default: 70

Set syntax: set MaxOpTemp [55-70]

Requires a SaveConfiguration command

Get syntax: get MaxOpTemp

### **MinOpTemp**

*Establishes/reports the minimum enclosure temperature alarm in degrees Celsius. If the temperature of the iPBridge falls below the minimum MinOpTemp, thermal control event handling occurs. Valid entries are between 0 and 15 degrees.*

Default: 0

Set syntax: set MinOpTemp [0-15]

Requires a SaveConfiguration command

Get syntax: get MinOpTemp

### **OpTempWarn**

*Controls the number of degrees in Celsius before a thermal control event handling occurs. Warnings are made via system log entries. Valid entries are between 0 and 15 degrees.*

Default: 5

Set syntax: set OpTempWarn [0-15]

Requires a SaveConfiguration command

Get syntax: get OpTempWarn

### **Password**

*Specifies a password for all sessions: NDMP, telnet, FTP and ExpressNAV web-based interface. A prompt asks for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command **RestoreConfiguration default** sets the password to its default value.*

Default: Password

Set syntax: set Password

Requires a SaveConfiguration command

### **Reserve**

*Reservation of the iPBridge is implicit: once the configuration image is changed by any user of services, the iPBridge becomes RESERVED. Executing a **SaveConfiguration** or **RestoreConfiguration** RELEASES the iPBridge so that other services users may access it. When iPBridge services interface is RESERVED, set commands from other users are unavailable.*

*At least one interface must always have access to the iPBridge.*

Immediate command: Reserve

### **RestoreConfiguration**

*Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option undoes any changes made since the last save.*

Immediate command: RestoreConfiguration [Default | Saved]

### **SCSIPortReset**

*Resets the specified SCSI bus.*

Immediate command: SCSIPortReset [sb]

## **SNTP**

*Controls the SNTP (Simple Network Time Protocol) settings for the iPBridge. When enabled, the iPBridge tries to contact a specified SNTP server at reset and every 12 hours after to initialize/synchronize the time.*

Default: Enabled

Set syntax: set SNTP [enabled|disabled]

Requires a SaveConfiguration command

Get syntax: get SNTP

## **SNTPServer**

*Controls the IP address of the SNTP time server that the iPBridge contacts to initialize/synchronize the time.*

*If the iPBridge is unable to contact the specified SNTP server within 30 seconds, the iPBridge tries to contact the first auxiliary SNTP time server. If the first auxiliary SNTP time server is not available, the iPBridge tries to contact the second auxiliary SNTP time server. If the second auxiliary SNTP time server is not available, the iPBridge continues to approximate the time based on the most recent SNTP time server, physical real time clock or manual initialization/synchronization.*

Auxiliary time servers

129.6.15.28 ([www.time-a.nist.gov](http://www.time-a.nist.gov))

132.163.4.101 ([www.time-a-timefreq.bidrdoc.gov](http://www.time-a-timefreq.bidrdoc.gov))

Default: 192.43.244.18 ([www.time.nist.gov](http://www.time.nist.gov))

Set syntax: set SNTPServer [xxx.xxx.xxx.xxx]

Requires a SaveConfiguration command

Get syntax: get SNTPServer

## **SpeedWrite**

*When enabled, improves the performance of FCP WRITE commands to SCSI devices attached to the iPBridge.*

*Specify SCSI bus (sb), target (st), LUN (sl) of a mapped SCSI device or (all) for each currently mapped device.*

Set syntax: set SpeedWrite scsi [sb st sl | all] [enabled | disabled]

Get syntax: get SpeedWrite scsi [sb st sl | all]

## **SpeedWriteDefault**

*When enabled, SpeedWrite performance enhancement is set as the default for any subsequent SCSI devices mapped manually or via an AutoMap operation. If disabled, the iPBridge does not attempt SpeedWrite performance enhancement to newly-mapped SCSI devices.*

Set syntax: set SpeedWriteDefault [enabled | disabled]

Get syntax: get SpeedWriteDefault

## **Time**

*Controls the time for the iPBridge if SNTP has been disabled or is not available.*

Set syntax: set Time [HH]:[MM]:[SS]

Requires a SaveConfiguration command

Get syntax: get Time

## **TimeZone**

*Controls the time zone for the iPBridge if SNTP has been disabled or is not available. Choices are EST, CST, MST, PST or numerical offset from GMT in the form of +/-:HH:MM. When SNTP is enabled, the iPBridge applies the time zone setting to the time retrieved from a specified SNTP time server to determine local time.*

Default: EST

Set syntax: set TimeZone [ [EST | CST | MST | PST] [+ / - HH :MM ] ]

Requires a SaveConfiguration command

Get syntax: get TimeZone

## **Username**

*Specifies user name for all telnet, FTP and ExpressNAV web server sessions. The user name is case insensitive, 1-32 characters, no spaces. Changes to the Admin Level user name require an Admin Level password.*

Default: root

Set syntax: set Username [username]

Requires a SaveConfiguration command

Get syntax: get Username

## **Zmodem**

*Allows transfer of a firmware image to or from the iPBridge using the ZMODEM file transfer protocol.*

*Zmodem is available only through the RS232 interface. Before using Zmodem, ensure all I/O to the iPBridge has stopped.*



### **CAUTION**

**After a firmware image is downloaded to the iPBridge, the image is placed into flash memory. During this time (about 60 seconds), DO NOT remove power to the iPBridge or the flash may become corrupted.**

Immediate command: Zmodem [Send filename | Receive]

## 7.1.4 Diagnostic commands

*ATTO iPBridge diagnostic commands help validate iPBridge operation and diagnose or isolate iPBridge faults. Event logging is a mechanism for on-site observation of internal iPBridge behavior such as tracing SCSI commands received over the GbE from the host and return of data and status to the host.*

### **BridgeModel**

*Reports model information about a specific iPBridge*

Get syntax: get BridgeModel

### **BridgeName**

*Specifies name used to identify individual iPBridge units.*

*May be up to a maximum of eight characters. It is not the World Wide Name (WWN).*

Set syntax: set BridgeName [value]

Takes effect immediately

Get syntax: get BridgeName

### **ClearEventLog**

*Clears the contents of the event log. No events are recorded until the command has been completed.*

Immediate command: ClearEventLog

### **ClearTraceLog**

*Clears the contents of the trace log. No events are recorded until the command has been completed.*

Immediate command: ClearTraceLog

### **DisplayEventLog**

*Displays the most recent page of event log entries. Typing a +, - or = causes the next, previous or same page of event log entries to be displayed. No events are recorded until the command has been completed. Type <escape> to disable the command, begin new log entries, and return to CLI.*

Immediate command: DisplayEventLog < + | - | = | q>

### **DisplayEventLogFilter**

*Filters the display of data for specific iPBridge subsystems when in **DisplayEventLog** mode. If enabled for a particular subsystem and level, that subsystem and level is masked when the command **DisplayEventLog** is issued.*

Subsystem entries: Log level entries:

SCSI	INFO
ENET	WARN
GEN	CRIT
NVRAM	FAIL
PERF	ALL
ECC	
ALL	
HTTP	
iSCSI	
NDMP	

Default: disabled

Set syntax: set DisplayEventLogFilter [subsystem] [level] [enabled|disabled]

Get syntax: get DisplayEventLogFilter [subsystem] [level]

### **DisplayTraceLog**

*Displays the most recent page of trace log entries. Typing a +, - or = causes the next, previous or same page of trace log entries to be displayed. No events are recorded until the command has been completed. Type <escape> to disable the command, begin new log entries, and return to CLI.*

Immediate command: DisplayTraceLog < + | - | = | q>

### **DisplayTraceLogFilter**

*Filters the display of data for specific iPBridge subsystems when in **DisplayTraceLog** mode. If enabled for a particular iPBridge port, that port is masked when the command **DisplayTraceLog** is issued.*

Default: disabled

Set syntax: set DisplayTraceLogFilter [ndmp| scsi | all] [dp |sb | all] [enabled | disabled]

Get syntax: get DisplayTraceLogFilter [ndmp | scsi | all] [dp |sb | all ]

## **DumpEventLog**

*Dumps the contents of the entire event log to an RS-232 or telnet session (over Ethernet) without impact on the log itself (the log is not cleared). No events are recorded until the command has been completed.*

Immediate command: DumpEventLog

## **DumpTraceLog**

*Dumps the contents of the entire trace log to an RS-232 or telnet session (over Ethernet) without impact on the log itself (the log is not cleared). No events are recorded until the command has been completed.*

Immediate command: DumpTraceLog

## **EventLog**

*When enabled, records various system events to the event log.*

Default: enabled

Set syntax: set EventLog [enabled|disabled]

Requires a SaveConfiguration command

Get syntax: get EventLog

## **EventLogFilter**

*Filters the display of data for specific iBridge subsystems when in EventLog mode. If enabled for a particular subsystem and level, that subsystem and level is masked when the command EventLog is issued.*

Subsystem entries: Log level entries:

SCSI	INFO
ENET	WARN
GEN	CRIT
NVRAM	FAIL
PERF	ALL
ECC	
ALL	
HTTP	
iSCSI	
NDMP	

Default: disabled

Set syntax: set EventLogFilter [subsystem] [level]  
[enabled|disabled]

Requires a SaveConfiguration command

Get syntax: get EventLogFilter [subsystem] [level]

## **Help**

*Displays a list of available commands. If command name is specified, displays detailed command-specific information.*

Immediate command: Help [command name]

## **IdentifyBridge**

*Enabling this option causes the Fault LED on the front panel of the iBridge 2500D to blink until the parameter is disabled.*

Default: disabled

Set syntax: set IdentifyBridge [enabled|disabled]

Get syntax: get IdentifyBridge

## **Info**

*Displays version numbers and other production information for key components within the iBridge.*

Immediate command: Info

## **iSCSITargetNameDisplay**

*Displays the iSCSI target name. If Multiple Target mode is enabled, iSCSI target names are listed for all existing iSCSI targets.*

Immediate command: iSCSITargetNameDisplay

## **IsReserved**

*Displays the reservation status of the current iBridge session/interface.*

*If set, the configuration image is being modified by another iBridge services session: set commands are temporarily unavailable but information commands are available.*

*Executing a **SaveConfiguration**,*

***RestoreConfiguration** or **FirmwareRestart***

*RELEASES the iBridge so that other services users may access it.*

*When iBridge services interface is RESERVED, set commands from other users are unavailable.*

*At least one interface must always have access to the iBridge.*

Immediate command: IsReserved

## **NDMPStatus**

*Shows status of all NDMP devices. The device name is not mutually exclusive, i.e., the same name may apply to a mover and tape/SCSI service at the same time.*

DeviceName: device connection name

Port: Ethernet port number [0|1]

Types: tape, SCSI

Host: IP address of host connection

State for Tape: idle, listen, active, paused or halted

State for SCSI: idle, busy

Immediate command: NDMPStatus

## Ping

*Sends an ICMP echo request to the specified host.*

Immediate command: Ping [DPn | MPn] [xxx.xxx.xxx.xxx] <count <size>>

## RMON

*RMON collects and stores Ethernet data on data ports at specified intervals. You can display the entire table requested, or a single entry based on the index (and sample index for the Ethernet History table).*

*Entries in the Ethernet History table are not valid when their Sample Index is 0.*

*Setting the history control entries take effect immediately, but changes must be saved to be persistent over a reboot.*

Valid range for EthernetStat index: 1-3

Valid range for historyControl and EthernetHistory index: 1-6

Valid range for historyControl buckets requested: 1-180

Valid range for historyControl interval: 1-3600

Default historyControl table (buckets and interval in hexadecimal): Refer to Exhibit 7.1-8 on page 52

Set syntax: set RMON idx buckets Request interval [valid | invalid]

Get syntax for entire table: get RMON [ethernetStat | historyControl] <idx>

Get syntax for single index entry: get RMON ethernetHistory <idx sampleIdx>

## RouteDisplay

*Displays a list of host protocol to SCSI address mappings on the bridge.*

*For NDMP, displays a list of NDMP name to SCSI Bus, Target, LUN mappings. The optional **name** parameter limits the list to the maps which satisfy a search for the given **name**.*

NumEntries: decimal number of map lines displayed

Name: 32-character NDMP device name

type: NDMP map type, either Tape or SCSI

sb: decimal SCSI bus number

st: decimal SCSI target number

sl: decimal SCSI LUN number

Immediate command: RouteDisplay NDMP <Name>

*For iSCSI:, displays a list of iSCSI to SCSI Bus, Target, LUN mappings. If Multiple Target mode has been enabled, the optional **Target Name** parameter limits the list to the maps which satisfy a search for the given target name. In either mode, the optional **LUN** parameter limits the list to the map which satisfies a search for the given **LUN**.*

NumEntries: decimal number of map lines displayed

Target Name: target name

Lun : target LUN

sb: decimal SCSI bus number

st: decimal SCSI target number

sl: decimal SCSI LUN number

Immediate command, single target mode:

RouteDisplay iSCSI <lun>

Immediate command, multiple target mode:

RouteDisplay iSCSI <Target Name> <lun>

## SCSIPortList

*Returns a list of available SCSI ports and their current status. Valid status returns are **O.K.** and **Failed**.*

Immediate command: SCSIPortList

## SCSITargets

*Returns a list of SCSI devices operational on the referenced SCSI port.*

Immediate command: SCSITargets [sb]

## SerialNumber

*Reports the serial number which is unique for each iPBridge. The serial number tracks the board throughout its life and should not be changed for any reason. Set form requires operator privileges.*

Information only: get SerialNumber

## SNMPDumpMIB

*Dumps the contents of the ATTO FibreBridge private SNMP MIB to the current CLI session. Consult your network administrator for further assistance with SNMP.*

Immediate: SNMPDumpMIB

## SNMPExtendedTraps

*Controls Extended SNMP map functioning such as device transition and device error. Consult your network administrator for further assistance with SNMP.*

Set syntax: set SNMPExtendedTraps [enabled|disabled]

Get syntax: get SNMPExtendedTraps

## **SNMPTrapAddress**

*Sets/displays the IP trap addresses and levels. Consult your network administrator for further assistance with SNMP.*

Index: value between 1 and 6

IP Address: standard IP address

Trap Level: severity required for an event to trigger a trap:

None: no traps will be sent to the address

All: all triggering events will be sent

Informational: a trap will be issued to the given address

Warning: warning and critical events will be sent

Critical: only critical events will trigger a trap

Set syntax: set SNMPTrapAddress [Index] [IPAddress]

[none | all | warning | critical ]

Get syntax: get SNMPTrapAddress

## **SNMPTraps**

*Enables/disables SNMP trap functions. Consult your network administrator for further assistance with SNMP.*

Default: disabled

Set syntax: set SNMPTraps [enabled | disabled]

Get syntax: get SNMPTraps

## **TailEventLog**

*Displays new events to the terminal. Press <ESC> to exit tail mode.*

Immediate: TailEventLog

## **Temperature**

*Returns the current internal temperature in degrees Celsius.*

Immediate command: get Temperature

## **TraceLog**

*When enabled, records various aspects of traffic the iPBridge receives to the trace log.*

Default: disabled

Set syntax: set TraceLog [enabled|disabled]

Get syntax: get TraceLog

## **TraceLogFilter**

*Filters the display of data for specific iPBridge subsystems when in TraceLog mode. If enabled for a particular port, that port is masked when the command TraceLogFilter is issued.*

Default: disabled

Set syntax: set TraceLogFilter [ndmp | scsi | all ] [dp | sb | all ] [enabled | disabled]

Get syntax: get TraceLogFilter [ndmp | scsi | all ] [dp| sb | all ]

## **Voltage**

*Displays the current level of voltages monitored by the iPBridge 2500.*

VCC: +5.0V

VDDA: +3.3V

VDBB: +2.5V

All: all monitored voltages

Get syntax: get Voltage [VCC|VDDA|VDBB|ALL]

## **WrapEventLog**

*When enabled, the iPBridge logs up to 2,048 event entries before wrapping (overwriting the first entries). If disabled, the iPBridge stops logging event entries when the buffer is full.*

Default: enabled

Set syntax: set WrapEventLog [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get WrapEventLog

## **WrapTraceLog**

*When enabled, the iPBridge logs up to 2,048 trace entries before wrapping (overwriting the first entries). If disabled, the iPBridge stops logging trace entries when the buffer is full.*

Default: enabled

Set syntax: set WrapTraceLog [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get WrapTraceLog

## 7.1.5 SCSI configuration commands

The SCSI ports are configured with default settings but may be customized to your specifications using the CLI commands in this section.

### **SCSIInitID**

Specifies the SCSI initiator ID to be used on the specified SCSI port. All maps coinciding with the user-specified SCSIInitID must be set to offline and becomes invalid upon issuing this command. Choices are 0 to 15.

Default: 7

Set syntax: set SCSIInitID [sb [0-15] ]

Requires a SaveConfiguration command

Get syntax: get SCSIInitID

### **SCSIPortBusSpeed**

Controls the transfer rate at which the iBridge tries to negotiate with its SCSI devices.

Default: Ultra3

Set syntax: set SCSIPortBusSpeed [sb [fast | ultra | ultra2 | ultra3] ]

Requires a SaveConfiguration command

Get syntax: get SCSIPortBusSpeed [PortNum]

### **SCSIPortList**

Returns a list of available SCSI ports and their current status. Valid status values are **O.K.** and **Failed**.

Immediate command: SCSIPortList

### **SCSIPortReset**

Resets the specified SCSI bus.

Immediate command: SCSIPortReset [sb]

### **SCSIPortResetOnStartup**

Specifies whether the SCSI port should be reset on power-up or not.

Default: enabled

Set syntax: set SCSIPortResetOnStartup [sb [enabled | disabled] ]

Requires a SaveConfiguration command

Get syntax: get SCSIPortResetOnStartup [sb]

### **SCSIPortSelTimeout**

Indicates the time, in milliseconds, that the bridge waits for a response from a SCSI device on the selected port after a selection request.

Information only command: get SCSIPortSelTimeout [sb]

### **SCSIPortSyncTransfer**

Specifies whether synchronous SCSI transfers should be negotiated with devices on the specified SCSI port.

Default: enabled

Set syntax: set SCSIPortSyncTransfer [[sb [enabled | disabled] ]

Requires a SaveConfiguration command

Get syntax: get SCSIPortSyncTransfer [sb]

### **SCSIPortTermination**

Configures/reports the SCSI internal termination of the SCSI port identified.

Default: enabled

Set syntax: set SCSIPortTermination [sb [ enabled | disabled]]

Requires a SaveConfiguration command

Get syntax: get SCSIPortTermination [sb]

### **SCSIPortWideTransfer**

Specifies whether wide SCSI transfers should be negotiated.

Default: enabled

Set syntax: set SCSIPortWideTransfer [sb [enabled | disabled] ]

Requires a SaveConfiguration command

Get syntax: get SCSIPortWideTransfer [sb]

### **SCSITargets**

Returns a list of SCSI devices operational on the referenced SCSI port. Also updates the current logical to physical address mapping configuration by updating the status of any online maps/routes to unavailable if a device is not found or to online if a device is found at the respective SCSI address.

Immediate command: SCSITargets [sb]

### **SpeedWrite**

*When enabled, improves the performance of WRITE commands to SCSI devices attached to the iPBridge. Specify SCSI bus (sb), target (st), LUN (sl) of a mapped SCSI device or (all) for each currently mapped device*

**Set syntax:** set SpeedWrite scsi [sb st sl | all] [enabled | disabled]

**Get syntax:** get SpeedWrite scsi [sb st sl | all]

*performance enhancement to newly-mapped SCSI devices.*

**Default:** disabled

**Set syntax:** set SpeedWriteDefault [enabled | disabled]

**Get syntax:** get SpeedWriteDefault

### **VirtualDriveResponse**

*Allows the iPBridge to provide proxy responses to SCSI INQUIRY and TEST UNIT READY commands if a SCSI device selection times out or is busy. Host systems can then assign devices consistently regardless of the device's state during the execution of the commands.*

**Default:** disabled

**Set syntax:** set VirtualDriveResponse [enabled | disabled]

**Get syntax:** get VirtualDriveResponse

## 7.1.6 Serial port configuration commands

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*The ATTO iPBridge serial ports or serial headers are configured with default settings but may be customized to your specifications using the CLI commands in this section.*

### **SerialPortBaudRate**

*Configures/reports the baud rate for the iPBridge RS-232 serial port or serial header. The number of data bits per character is fixed at 8 with no parity. Choices are 2400, 9600, 19200, 38400, 57600 and 115200.*

Default: 115200

Set syntax: set SerialPortBaudRate [2400 | 9600 | 19200 | 38400 | 57600 | 115200]

Requires a SaveConfiguration command

Get syntax: get SerialPortBaudRate

### **SerialPortEcho**

*Enables/disables/reports the echoing of keyboard input. When enabled, all non-control character keyboard input is output to the display. Local ASCII terminal (or terminal emulator) echo settings should be set to disabled while using **SerialPortEcho** enabled.*

Default: enabled

Set syntax: set SerialPortEcho [enabled | disabled]

Requires a SaveConfiguration Restart command

Get syntax: get SerialPortEcho



## 7.1.7 Ethernet commands

These commands configure the management and data Ethernet ports including telnet parameters.

### DPMTU

Controls the MTU (Maximum Transmission Unit) used by the Ethernet ports: Increasing the MTU may improve throughput.

Default: 1514

Set syntax: set DPMTU [DPn | MPn| all] [1514 | 9014 |16128]

Requires a SaveConfiguration command

Get syntax: get DPMTU [DPn | MPn| all]

### EthernetSpeed

Specifies the speed of the Ethernet ports. If auto is enabled, the speed is negotiated. Speeds 10 and 100 are half duplex. If you want to run the iPBridge at 10baseT, you must set the Ethernet speed using this command..

Choices are

10 = 10 baseT

100 = 100 baseT

1000 =1000baseT

Default: auto

Set syntax: set EthernetSpeed [DPn | MPn| all] [10 | 100 | 1000 | Auto]

Requires a SaveConfiguration command

Get syntax: get EthernetSpeed [DPn | MPn| all]

### Exit

Exits the current telnet CLI session; it has no effect if used during a serial CLI session.

Immediate command: Exit

### IPAddress

Controls the IP address of the iPBridge Ethernet data ports. If IPDHCP is enabled, the **get** command reports the current IP address assigned by the network DHCP server, followed by the DHCP identifier.

Default IP addresses:

[10.0.0.1]

[10.0.0.2]

[10.0.0.3]

Set syntax: set IPAddress [DPn | MPn] xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

Get syntax: get IPAddress [DPn | MPn| all]

### IPDHCP

Selecting DHCP allows the iPBridge to request an IP address from the network DHCP server. The network must have at least one DHCP server.

Default: enabled

Set syntax: set IPDHCP [DPn | MPn | all] [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get IPDHCP [DPn | MPn| all]

### IPGateway

Controls the current gateway. If IPDHCP is enabled (see above), **get** command reports the current IP gateway assigned by the network DHCP server.

Default: 0.0.0.0

Set syntax: set IPGateway [DPn | MPn | all]

xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

Get syntax: get IPGateway [DPn | MPn| all]

### IPSubnetMask

Controls the current subnet mask. If IPDHCP is enabled (see above), **get** command reports the current subnet mask assigned by the DHCP server.

Default: 255.255.0.0

Set syntax: set IPSubnetMask [DPn | MPn| all]

xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

Get syntax: get IPSubnetMask [DPn | MPn| all]

### Password

Specifies a password for all sessions: NDMP, telnet, FTP and ExpressNAV web-based interface. A prompt asks for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command **RestoreConfiguration default** sets the password to its default value.

Default: Password

Set syntax: set Password

Requires a SaveConfiguration command

## Ping

*Sends an ICMP echo request to the specified host.*

Immediate command: ping [DPn | MPn] [xxx.xxx.xxx.xxx]  
<count <size>>

## ReadOnlyPassword

*Specifies a read only password for all sessions: NDMP, telnet, FTP and ExpressNAV web-based interface. A prompt asks for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command **RestoreConfiguration default** sets the password to its default value.*

Default: Password

Set syntax: set ReadOnlyPassword [password]

Requires a SaveConfiguration command

## RMON

*RMON collects and stores Ethernet data on data ports at specified intervals. You can display the entire table requested, or a single entry based on the index.*

*Entries in the Ethernet History table are not valid when their Sample Index is 0.*

*Setting the history control entries take effect immediately, but changes must be saved to be persistent over a reboot.*

Valid range for EthernetStat index: 1-3

Valid range for historyControl and EthernetHistory index: 1-6

Valid range for historyControl buckets requested: 1-

180

Valid range for historyControl interval: 1-3600

Default historyControl table (buckets and interval in hexadecimal): Refer to Exhibit 7.1-8 below.

Set syntax: set RMON idx bucketsRequest interval [valid | invalid]

Get syntax for entire table: get RMON [ethernetStat | historyControl] <idx>

Get syntax for single index entry: get RMON ethernetHistory <idx sampleIdx>

## Username

*Specifies a user name for all telnet, FTP and ExpressNAV web server sessions. **Username** is case insensitive, 1-32 characters with no spaces. Changes to the Admin Level user name requires an Admin Level password.*

Default: root

Set syntax: set Username [username]

Requires entering a password

Requires a SaveConfiguration command

Get syntax: get Username

## ReadOnlyUsername

*Specifies a read only user name for all telnet, FTP and ExpressNAV web server sessions. **Username** is case insensitive, 1-32 characters with no spaces.*

Default: user

Set syntax: set ReadOnlyUsername [username]

Requires a SaveConfiguration command

Get syntax: get ReadOnlyUsername

*Exhibit 7.1-8 Default history Control table (buckets and interval in hexadecimal) for the RMON CLI command.*

Idx	DataSrc	BktReq	BktGrant	Interval	Owner	Status
001	43.6.1.2.1.2.2.1.1.1	00000032	00000032	0000001e	monitor	00000004
002	43.6.1.2.1.2.2.1.1.1	00000032	00000032	00000708	monitor	00000004
003	43.6.1.2.1.2.2.1.1.2	00000032	00000032	0000001e	monitor	00000004
004	43.6.1.2.1.2.2.1.1.2	00000032	00000032	00000708	monitor	00000004
005	43.6.1.2.1.2.2.1.1.3	00000032	00000032	0000001e	monitor	00000004
006	43.6.1.2.1.2.2.1.1.3	00000032	00000032	00000708	monitor	00000004

## 7.1.8 NDMP commands

If your iPBridge has been configured for NDMP, default settings to the two iPBridge Ethernet data ports may be customized to your specifications using the CLI commands in this section.



### Note

For NDMP-configured iPBridge 2500 models only

#### NDMPAuthType

Controls the security level used by the iPBridge for NDMP authentication for all ports.

Default: none

Set syntax: set NDMPAuthType [none | text | md5]

Requires a SaveConfiguration command

Get syntax: get NDMPAuthType

#### NDMPMaxVersion

Controls the highest NDMP version to which the iPBridge negotiates for each Ethernet data port.

Default: 4

Set syntax: set NDMPMaxVersion [DPn | all] [3 | 4]

Requires a SaveConfiguration command

Get syntax: get NDMPMaxVersion

#### NDMPPortNumber

Controls the NDMP port number that to be used by the iPBridge for each Ethernet data port.

Default: 10000

Set syntax: set NDMPPortNumber [DPn | all] [PortNum]

Requires a SaveConfiguration command

Get syntax: get NDMPPortNumber

#### NDMPStatus

Shows status of all NDMP servers, including mover servers. The server name is not mutually exclusive, i.e., the same server name may apply to a mover and tape/SCSI service at the same time.

ServerName - Device connection name

Port - Ethernet port number [0|1]

Type - tape, mover, SCSI

Host - IP address of host connection

State - [idle | listen | active | paused | halted]

Immediate command: NDMPStatus



## 7.1.9 iSCSI commands

If your iPBridge has been configured for iSCSI, default settings may be customized to your specifications using the CLI commands in this section.



### Note

For iSCSI-configured iPBridge models only

#### iSCSIAlias

Provides a human-readable name assigned to the iPBridge. Aliases may be 1 to 64 characters long and may contain spaces if spaces are enclosed in quotation marks. Entering the **set iSCSIAlias** command with no alias parameter causes the alias to be removed.

Default: 0

Set syntax: `set iSCSIAlias [Alias]`

Requires a SaveConfiguration command

Get syntax: `get iSCSIAlias`

#### iSCSIChap

Enables/disables requiring CHAP (Challenge-Handshake Authentication Protocol) to be used for the iSCSI protocol. If **Multiple Target mode** has been enabled, a valid target name must be provided. If **CHAP** is enabled, the target requires the initiator to negotiate CHAP authentication using the CHAP secrets. An initiator may reject this negotiation.

Default: disabled

In single target mode

Set syntax: `set iSCSIChap [enabled | disabled]`

Get syntax: `get iSCSIChap`

In multiple target mode

Set syntax: `set iSCSIChap [Target Name] [enabled | disabled]`

Get syntax: `get iSCSIChap [Target Name]`

#### iSCSIChapSecret

Specifies the incoming and outgoing passwords for iSCSI chap sessions. **RestoreConfiguration default** sets the CHAP secret passwords pair to default values.

Secrets are case sensitive, 12 (16 for Microsoft iSCSI initiator) to 32 characters, and cannot contain spaces. **In** and **out** secrets must be different.

When either secret is all 0s, iSCSI CHAP authentication is disabled. Additionally, an all '0' secret can be configured by entering the **iSCSIChapSecret** command confirmation prompts with no parameters.

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An **in** CHAP secret is for authentication of the server to the iPBridge. The iPBridge can store up to 32 **in** secrets, each with a unique **Account Name** (optionally the Initiator Name) and secret pair. The Account Name can be 1 to 223 characters. Account Names are case sensitive. Account name can not be **all**.

An **out** chap secret is for authentication of the iPBridge to the rest of the network. There can only be one out secret. The account name is ignored for out secrets and defaulted to **root**.

In multiple target mode, you may use **discovery** to determine the **Target Name**.

In single target mode

Set syntax: `set iSCSIChapSecret [in | out | delete]`

`[Account Name] <Secret>`

Get syntax: `get iSCSIChapSecret [Account Name | all]`

In multiple target mode

Set syntax: `set iSCSIChapSecret [Target Name | discovery] [in | out | delete]`

`[Account Name] <Secret>`

Get syntax: `get iSCSIChapSecret [Target Name]`

`[Account Name | all]`

#### iSCSIPortNumber

Specifies the port number whereby the iPBridge listens for iSCSI connections. The port number must be between 1024 and 65535 except for port 860.

Default: 3260

Set syntax: `set iSCSIPortNumber [portnum]`

Requires a SaveConfiguration command

Get syntax: `get iSCSIPortNumber`

#### iSCSITarget

Creates/deletes an iSCSI target name. The target name acts as a suffix to the standard bridge iSCSI-qualified name. The target name may not exceed 24 characters. A newly-created target has one LUN, the iPBridge LUN, at LUN 0. If the target name already exists, this command does nothing. **Multiple Target mode** must be enabled to use this command. In verbose mode, overwriting a map requires secondary confirmation of the action.

Immediate command: `iSCSI [Target Name] <delete>`

**iSCSITargetNameDisplay**

*Displays the iSCSI target name. If Multiple Target mode is enabled, iSCSI target names are listed for all existing iSCSI targets.*

Immediate command: iSCSITargetNameDisplay

**iNSLoginControl**

*Specifies whether the iPBridge delegates its access control/authorization to an iNS server.*

Default: disabled

Set syntax: set iNSLoginControl [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get iNSLoginControl

**iNSServer**

*Specifies whether the IP address of a valid iNS server from which the iPBridge attempts iSCSI initiator discovery. Setting to 0.0.0.0 disables iNS server lookup.*

Default: 0.0.0.0

Set syntax: set iNSServer [xxx.xxx.xxx.xxx]

Requires a SaveConfiguration command

Get syntax: get iNSServer

**MultiTargetMode**

*Enables/disables iSCSI multiple target mode addressing on the iPBridge. If enabled, all previous maps are deleted. In verbose mode, overwriting a map requires secondary confirmation of the action.*

Set syntax: set MultiTargetMode [enabled | disabled]

Get syntax: get MultiTargetMode

## 7.1.10 Mapping commands

You may map devices via the web-based server or through the management or serial ports. Refer to [Mapping devices: NDMP](#) on page 13 and [Mapping devices: iSCSI](#) on page 15 for details.

### AutoMap

Automatically assigns a subset of NDMP device name protocol addresses or iSCSI LUNs to a subset of SCSI target destination devices visible to the iPBridge. Valid existing maps are not deleted.

Immediate command: AutoMap

to the same NDMP name, the new BTL overwrites the previous map. Using the **Delete** identifier removes the map from the map table. In verbose mode, overwriting a map requires secondary confirmation of the action.

Immediate command: Route NDMP [Tape | SCSI] [srcName] [SCSI [bb tt ll] | Delete]

### iSCSITarget

Creates/deletes an iSCSI target name. The target name acts as a suffix to the standard bridge iSCSI-qualified name. The target name may not exceed 24 characters. A newly-created target has one LUN, the iPBridge LUN, at LUN 0. If the target name already exists, this command does nothing. **Multiple Target mode** must be enabled to use this command. In verbose mode, overwriting a map requires secondary confirmation of the action.

Immediate command: iSCSI [Target Name] <delete>

For **iSCSI**, assigns an iSCSI protocol address to a target destination device. If **Multiple Target mode** has been enabled, a valid target name must be specified. If you try to map a new SCSI BTL to the same iSCSI LUN, the new BTL overwrites the previous map. Using the **Delete** identifier removes the map from its map table. In verbose mode, overwriting a map requires secondary confirmation of the action.

Immediate command in single target mode:

Route iSCSI [lun] [SCSI [bb tt ll] | Delete]

Immediate command in multiple target mode:

Route iSCSI [Target Name] [lun] [SCSI [bb tt ll] | Delete]

### iSCSITargetNameDisplay

Displays the iSCSI target name. If **Multiple Target mode** is enabled, iSCSI target names are listed for all existing iSCSI targets.

Immediate command: iSCSITargetNameDisplay

### RouteDisplay

Displays a list of host protocol-to-SCSI address mappings on the bridge.

For **NDMP**, displays a list of NDMP name to SCSI Bus, Target, LUN mappings. The optional **name** parameter limits the list to the maps which satisfy a search for the given name.

NumEntries: decimal number of map lines displayed

Name: 32-character NDMP device name

type: NDMP

map type: either Tape or SCSI

sb: decimal SCSI bus number

st: decimal SCSI target number

sl: decimal SCSI LUN number

Immediate command: RouteDisplay NDMP <Name>

For **iSCSI**, displays a list of iSCSI to SCSI Bus, Target, LUN mappings. If **Multiple Target mode** has been enabled, the optional **Target Name** parameter limits the list to the maps which satisfy a search for the given target name. In either mode, the optional **LUN** parameter limit

### Route

Assigns a host protocol address to a target destination device.

For **NDMP**, assigns an NDMP device name to a target destination device. More than one NDMP name may be assigned to a SCSI BTL. If you try to map a new SCSI BTL

*the list to the map which satisfies a search for the given LUN.*

NumEntries: decimal number of map lines displayed

Target Name: target name

Lun : target LUN

sb: decimal SCSI bus number

st: decimal SCSI target number

sl: decimal SCSI LUN number

Immediate command, single target mode:

RouteDisplay iSCSI <lun>

Immediate command, multiple target mode:

RouteDisplay iSCSI <Target Name> <lun>

### **SCSIIInitID**

*Specifies the SCSI initiator ID to be used on the specified SCSI port. All maps coinciding with the user-specified SCSIIInitID must be set to offline and become invalid upon issuing this command. Choices are 0 to 15.*

Default: 7

Set syntax: set SCSIIInitID [sb [0-15] ]

Requires a SaveConfiguration command

Get syntax: get SCSIIInitID

### **SCSITargets**

*Returns a list of SCSI devices operational on the referenced SCSI port.*

Immediate command: SCSITargets [sb]

# Appendix A ATTO iPBridge, FibreBridge family

The ATTO bridge family of products provides iSCSI-to-SCSI, iSCSI to Fibre Channel or Fibre Channel-to-SCSI bridges available as Compact PCI (cPCI) boards, stand alone enclosures that can be fitted for rackmount integration, or desktop units, depending on the model and your needs.

The ATTO iPBridge and ATTO FibreBridge family of products share common configuration options and functions to provide the most versatile connectivity options available. Each product has been engineered to address specific customer needs. New capabilities are integrated

into products throughout the family as much as possible, requiring only an upgrade of firmware to incorporate them into your SAN (Storage Area Network) or NAS (Network Attached Storage). Check the website, [www.attotech.com](http://www.attotech.com), for the latest firmware updates.

## iPBridge products

Product features	2500C/R/D	2700C/R/D	1500E/D	1550E/D
Number of GigE ports	3	4	1	1
Number of SCSI ports	2	NA	1	1
SCSI interface	LVD/SE	NA	LVD	LVD
Number of FC ports	NA	2	NA	NA
FC interface	NA	SFP	NA	NA
Data transfers	NA	4 Gigabit	NA	NA
Ethernet interface	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet
Data transfer	Wire speed	Wire speed	37 MB/sec.	Wire speed
Configuration	cPCI board Desktop Rack	cPCI board Desktop Rack	Embedded Desktop	Embedded Desktop
Full duplex data transfers	✓	✓	✓	✓
Supports Class 2 transfers & direct fabric connect	NA	Class 3 only	NA	NA
Supports error recovery	✓	✓	✓	✓
Bridge management available				
• Serial	✓	✓	✓	✓
• Ethernet	✓	✓	✓	✓
• In-band	✓	✓	✓	✓
Diagnostics	Advanced	Advanced	Standard	Standard
ExpressNAV web management	✓	✓	✓	✓
iSCSI SANS	✓	✓	✓	✓
NDMP/NAS	✓	NA	NA	NA

## Fibre Bridge products

Product features	1180E/D	1290E	2300E/R/D	2350C	3300R	2400C/R/D	4500C/R/D
Number of Fibre Channel ports	1	1	1	1	1	2	1
FC interface	DB9/SC	SFP	SFP	SFP	SFP	SFP	SC
Data transfers	1 Gigabit	2 Gigabit	2 Gigabit	2Gigabit	2 Gigabit	4 Gigabit	1 Gigabit
Number of SCSI ports	1	2	2	2	2	2	4
SCSI interface	LVD/SE	LVD/SE	LVD/SE	LVD/SE	LVD/SE	LVD/SE VHDCI	LVD/SE Ultra2 HVD UltraSCSI VHDCI
Data transfers	Ultra2	Ultra3	Ultra3	Ultra3	Ultra3	Ultra320	Ultra2
Configuration	Embedded board Desktop	Embedded board	Embedded board Rack Desktop	cPCI embedded board	Rack	cPCI board Desktop Rack	cPCI board Desktop Rack
Full duplex data transfers	✓	✓	✓	✓	✓	✓	✓
Supports Class 2 transfers	✓	✓	✓	✓	✓	Class 3 only	✓
Supports intermix transfers, direct fabric connect, error recovery	✓	✓	✓	✓	✓	✓	✓
Bridge management available							
• Serial	✓	✓	✓	✓	✓	✓	✓
• Ethernet	✓	✓	✓	✓	✓	✓	✓
• In-band	✓	✓	✓	✓	✓	✓	✓
Serverless backup	✓	✓	✓	✓	✓		✓
Supports port failover						✓	✓
Diagnostics	Standard	Standard	Standard	Advanced	Standard	Advanced	Standard
ExpressNAV web management		✓	✓	✓	✓	✓	✓

# Appendix B Cabling

*Additional information to physically connect ports to devices and to your SAN.*

## SCSI cabling

Cables and devices must be chosen to maximize performance and minimize the electrical noise from the high-speed data transfers available with the SCSI protocol. Cabling and termination methods become important considerations for proper performance. SCSI cables and devices are subject to specific length and number limitations to deal with electrical problems that arise at increased operating speeds.

### Cable types

Use high-quality cables rated for the type of SCSI transfers required: well-insulated SCSI cables ensure error free communications. Try to keep cable lengths as short as possible to ensure higher signal quality and performance.

### Examples

The SCSI specification limits total bus cable length for single-ended SCSI in a non-UltraSCSI environment to 3 meters (combined length of both internal and external cable lengths).

In an UltraSCSI workgroup environment with a 7-drive tower, you are limited to 1.5 meters between the host and the tower, including the cabling for the tower. If the 7-drive tower requires 1 meter of cabling to connect all of its drives, the distance from the tower to the host must be .5 meters.



#### Note

*UltraSCSI is very sensitive to SCSI bus noise, cable distances and the number of devices connected on the SCSI bus. Carefully connect your devices when working with UltraSCSI.*

*Exhibit 0.0-1 Various types of SCSI operate at different speeds and require different bus lengths to support a certain number of devices.*

STA terms	Bus speed MB/sec. max.	Bus width bits	Max. bus lengths in meters			Max. device support
			Single- ended	Differential	LVD	
Fast SCSI	10	8	3	25	n/a	8
Fast/WIDE SCSI	20	16	3	25	n/a	16
UltraSCSI	20	8	1.5	25	n/a	8
Ultra/WIDE SCSI	40	16	n/a	25	n/a	16
Ultra/WIDE SCSI	40	16	1.5	n/a	n/a	8
Ultra/WIDE SCSI	40	16	3	n/a	n/a	4
Ultra2 SCSI	80	16	n/a	n/a	12	8
Ultra2/WIDE SCSI	80	16	n/a	n/a	12	16
Ultra3/WIDE SCSI	160	16	n/a	n/a	12	16

### Connecting SCSI devices to SCSI ports

ATTO iBridge SCSI ports connect SCSI storage devices to the network. Each SCSI port is completely independent from the other SCSI port.

Each SCSI port is a bus capable of supporting 15 devices and each bus is capable of 40, 80 or 160 MB/sec. (Ultra, Ultra2 or Ultra3) transfer rates.

You may use externally provided striping software to create a RAID 0 group that includes

devices from both SCSI busses to increase overall performance.

Each SCSI bus auto-negotiates the appropriate sync rates with the connected devices. If slower devices are mixed with faster devices, the bus communicates at the rate of the slowest device, thus wasting the performance capabilities of the faster devices. Connect slower devices to one SCSI port and connect faster devices to the other port.

The iPBridge supports a wide variety of SCSI storage devices including stand-alone drives, removable drives, JBODs, RAIDs, tape, CD and DVD drives, changers and libraries.

- 1 Connect the cable from the SCSI device to a VHDCI SCSI port on the iPBridge.
- 2 Check the type of cable, cable length limit and number of devices recommended for the port. See Exhibit 0.0-1.

Keep cable lengths as short as possible to ensure the highest signal quality and performance. These cable lengths include the wiring inside the devices.

- 3 Set the IDs of the SCSI devices connected to the bridge to a value other than 7. Use a sequential ID starting at 0 for each device. The SCSI port in the ATTO iPBridge has an internal factory setting ID of 7, typical for a SCSI initiator device.



#### Note

*The entire SCSI bus operates at the speed of the slowest device on that bus. If you wish to mix devices of different SCSI speeds, place the devices on separate busses. That is, put the slower devices on iPBridge 2500 SCSI bus 0, and the faster devices on iPBridge 2500 SCSI bus 1. Each bus is independent so each can operate at different speeds.*

- 4 Terminate the SCSI bus after the last device. The iPBridge is terminated internally.

## Ethernet connections

Use at least Cat 5e cable to connect the Ethernet ports to your network.



#### Note

*For best performance, all cabling, network interface cards (NICs), host bus adapters (HBAs), and network switches must be Gigabit Ethernet (GbE), and at least Cat 5e certified. Most standard offices use 2-pair wiring which is not compatible. GbE requires 4-pair wiring.*

For best performance, support for 9014 byte jumbo frames should be available for all switches and host iSCSI equipment.

Before you begin installing the iPBridge Ethernet ports, be sure to check or complete the following:

- If you are managing your iSCSI system across a WAN and your system uses a firewall, be sure that the following ports are open and available:

If you are using the TCP protocol

- telnet (port 23)
- http (port 80)
- ftp (ports 20 and 21)
- iSCSI (port 3260)

- iSNS (port 3705)

If you are using the UDP protocol

- ntp (port 123)

- Be sure your host system(s) is set up and configured.

- Your host system can use any of three different types of cards: a network interface card (NIC), a telnet offload engine card (TOE), or a storage network interface card (SNIC).

- The ATTO driver file from the CD included with your iPBridge or from the ATTO website, [www.attotech.com](http://www.attotech.com), is installed on your host.

- The switch has been configured to forward UDP broadcast messages.

- The minimum requirement for Windows-based browsers is Internet Explorer 5.5 or Netscape Navigator 6.2. The minimum requirement for Macintosh browsers is Internet Explorer 5.2 or Safari 1.2.

- Ethernet speed defaults to auto; the iPBridge determines the speed and set other parameters based on the speed.

## Appendix C Glossary

*More information is available through the Storage Networking Industry Association ([www.snia.org/education/dictionary](http://www.snia.org/education/dictionary)), the Network Data Management Task Force ([www.ndmp.org](http://www.ndmp.org)), and the IETF ([www.ietf.org](http://www.ietf.org)).*

Term	Definition
Btl	Bus-Target-LUN: Identification for a parallel SCSI device
CHAP	Challenge-Handshake Authentication Protocol: If <b>CHAP</b> is enabled, the target requires the initiator to negotiate CHAP authentication using the CHAP secrets (passwords). An initiator may reject this negotiation
DP data port	GbE port used for data movement and inband management
firmware	Software stored in read-only memory (ROM) or programmable ROM (PROM); firmware is often responsible for the behavior of a system when it is first switched on
GbE Gigabit Ethernet	A protocol for transferring block-level IO over telnet networks; speed at which data is passed over Ethernet
IETF	Internet Engineering Task Force: The standards body responsible for Internet standards such as SNMP and telnet through a community of network designers, operators, vendors and researchers concerned with the evolution and smooth operation of the Internet
initiator device	A component which originates a command
iSCSI	Internet SCSI (Small Computer System Interface), a protocol to link data storage facilities over the Internet or an intranet developed by the Internet Engineering Task Force (IETF); carries SCSI commands over IP networks to facilitate data transfers over intranets and manage storage over long distances
LED	Light-emitting diode, a type of diode that emits light when current passes through it; visible LEDs are used as indicator lights on all sorts of electronic devices
LUN	Logical Unit Number: a SCSI identifier of a device
MPn Management Port	GbE port used for management but which may also be used as a data port
Metadata	Information (file marks, directory name information) stored on the tape to assist data management; content of the metadata is the sole responsibility of the NDMP Data Management Application
NAS	Network Attached Storage: storage elements connected to a network to provide file access services to computer systems; an NAS Storage Element includes an engine to implement the file services and one or more devices to store data; NAS elements may be attached to any type of network; an NAS host system uses a file system device driver to access data and NAS systems interpret these commands to execute the necessary internal file and device I/O operations
NDMP	Network Data Management Protocol: A protocol for data backup and restore over telnet networks which uses file-based IO
SCSI	Small Computer Systems Interface: a processor-independent standard for system-level interface between a computer and intelligent devices including hard disks, floppy disks, CD-ROM, printers, scanners, etc.

Term	Definition
SNMP	Simple Network Management Protocol: a standard for monitoring and managing systems and devices in a network; data is defined by a MIB; functions supported include the request and retrieval of data
SNTP	Simple Network Time Protocol: uses a server to set the time and date over the Ethernet port.
Tape Window	A fixed-size parameter indicating the maximum data length that can be written to a tape in one Data Mover action; once the tape window is reached, the Data Mover pauses until writes occur and the tape window becomes available.

## Appendix D Safety standards and compliances

*The equipment described in this manual generates and uses radio frequency energy. If this equipment is not used in strict accordance with the manufacturer's instruction, it can and may cause interference with radio and television reception. Refer to the Technical Specification sheet available at [www.attotech.com](http://www.attotech.com) for a full list of certifications.*



### WARNING

**Risk of explosion if battery is removed and/or replaced by an incorrect type. Dispose of used batteries in accordance with your local environmental regulations.**

**No operator serviceable components inside the iPBridge 2500C/R/D.**

**Do not remove cover of iPBridge 2500R/D. Refer servicing to qualified personnel.**



### FCC Standards: Radio and Television Interference



### WARNING

**This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide a reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.**

If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures

- Move the receiving antenna.
- Relocate the bridge with respect to the receiver, or move the bridge away from the receiver.
- Plug the computer into a different outlet so the computer and receiver are on different branch circuits.
- If necessary, consult an ATTO authorized dealer, ATTO Technical Support Staff, or an experienced radio/television technician for additional suggestions.

The booklet *How to Identify and Resolve Radio/TV Interference Problems* prepared by the Federal Communications Commission is a helpful guide. It is available from the US Government printing office, Washington, DC 20402, Stock No. 004-000-00345-4.



### Canadian Standards

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.



## European Standards

Declaration of Conformity

This following statement applies to the ATTO iPBridge.

This device has been tested in the basic operating configuration and found to be compliant with the following European Union standards

Application of Council Directive: 89/336/EEC

Standard(s) to which conformity is declared: EN55022, EN50082-1, EN60950

This Declaration will only be valid when this product is used in conjunction with other CE approved devices and when the entire system is tested to the applicable CE standards and found to be compliant.

100-240 VAC, 0.75-0.35 A, 50-60Hz

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) for information technology equipment. If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

VCCI-A

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

警告使用者：  
這是甲類的資訊產品，在  
居住的環境中使用時，可  
能會造成射頻干擾，在這  
種情況下，使用者會被要  
求採取某些適當的對策。



ISO 7779



## **Appendix E ATTO accessories**

*The following accessories are available through ATTO Technology. Contact an ATTO Technology authorized sales representative to order.*

### **iSCSI Bridge board-level models**

#### **ATTO iPBridge 2700C**

IPBR-2700-C00 4 Gigabit Ethernet by 2 4-Gb Fibre Channel

#### **ATTO iPBridge 2500C**

IPBR-2500-C00 3 Gigabit Ethernet by 2 LVD SCSI

#### **ATTO iPBridge 1500E**

IPBR-1500-E00 1 Gigabit Ethernet by 1 LVD SCSI, up to 37 MB/sec.

#### **ATTO iPBridge 1550E**

IPBR-1550-E00 1 Gigabit Ethernet by 1 LVD SCSI, up to 100 MB/sec.

### **iSCSI Bridge desktop models & desktop models with rackmount kits**

#### **ATTO iPBridge 2700R/D**

IPBR-2700-D00 4 Gigabit Ethernet by 2 r-Gb Fibre Channel

#### **ATTO iPBridge 2500R/D**

IPBR-2500-D00 3 Gigabit Ethernet by 2 LVD SCSI

#### **ATTO iPBridge 1500D**

IPBR-1500-D00 1 Gigabit Ethernet by 1 LVD SCSI 1, up to 37 MB/sec.

#### **ATTO iPBridge 1550D**

IPBR-1550-D00 1 Gigabit Ethernet by 1 LVD SCSI 1, up to 100 MB/sec.

### **NDMP Bridge models**

#### **ATTO iPBridge 2500**

IPBR-2500-CN0 3 Gigabit Ethernet by 2 LVD SCSI (board)

IPBR-2500-DN0 3 Gigabit Ethernet by 2 LVD SCSI (desktop)

### **Cables**

CBL-F68R-681 SCSI, Internal Ribbon, 68pin "P"/68pin "P"-0.5m

CBL-HD68-681 SCSI, External, HD68 to HD68, U320-rated, 1m

CBL-LCLC-003 Fibre Channel, Optical, LC to LC, 3m.

CBL-LCLC-010 Fibre Channel, Optical, LC to LC, 10m.

CBL-LCSC-003 Fibre Channel, Optical, LC to SC, 3m.

CBL-LCSC-010 Fibre Channel, Optical, LC to SC, 10m.

### **Accessories**

TERM-V68E-002 Terminator, LVD SCSI, VHDCI, Active 125

ADAP- 50AF- 68P\* Adapter, SCSI, 50pin "A" Female to 68pin "P" Female 60

SFP2-0000-000 Adapter, 2-Gigabit Fibre Channel, Short Wave Optical, SFP LC

SFP4-0000-000 Adapter, 4-Gigabit Fibre Channel, Short Wave Optical, SFP LC

### **Cables: RS232**

CBL-0911-001 Cable, Serial RS232, RJ11 to DB9, 10 ft.

## Appendix F Warranty, contact information

### **Manufacturer limited warranty**

Manufacturer warrants to the original purchaser of this product that it will be free from defects in material and workmanship as described in the ATTO Technology website, [www.attotech.com](http://www.attotech.com). Manufacturer liability shall be limited to replacing or repairing, at its option, any defective product. There will be no charge for parts or labor should Manufacturer determine that this product is defective.

Products which have been subject to abuse, misuse, alteration, neglected, or have been serviced, repaired or installed by unauthorized personnel shall not be covered under this warranty provision. Damage resulting from incorrect connection or an inappropriate application of this product shall not be the responsibility of Manufacturer. Manufacturer's liability is limited to Manufacturer's product(s); damage to other equipment connected to Manufacturer's product(s) will be the customer's responsibility.

This warranty is made in lieu of any other warranty, express or implied. Manufacturer disclaims any implied warranties of merchantability or fitness for a particular purpose. Manufacturer's responsibility to repair or replace a defective product is the sole and exclusive remedy provided to the customer for breech of

this warranty. Manufacturer will not be liable for any indirect, special, incidental, or consequential damages irrespective of whether Manufacturer has advance notice of the possibility of such damages. No Manufacturer dealer, agent or employee is authorized to make any modification, extension or addition to this warranty.

### **Contact ATTO Technology, Inc.**

Customer service, sales and technical support are available by phone Monday through Friday, 8 a.m. to 5 p.m EST., or by fax and web site 24-hours a day.

ATTO Technology, Inc.  
155 CrossPoint Parkway  
Amherst, New York 14068  
(716) 691-1999 • voice  
(716) 691-9353 • fax  
<http://www.attotech.com>

ATTO Technology can also be reached via e-mail at the following addresses:

*Sales Support:* [sls@attotech.com](mailto:sls@attotech.com)  
*Technical Support:* [techsupp@attotech.com](mailto:techsupp@attotech.com)